

# THEORY AND TECHNIQUE IN LEXICAL DESCRIPTION

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By

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*to the*

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50058

To  
my mother  
and  
to the loving memory of  
my father



# CERTIFICATE

This is to certify that the thesis entitled "Theory and Technique in Lexical Description" submitted by Kiran Biswas in partial fulfilment for the degree of Doctor of Philosophy to the Indian Institute of Technology, Kanpur, is a record of bonafide research work carried out by her under my supervision and guidance. The results embodied in this thesis have not been submitted elsewhere for the award of any degree or diploma.

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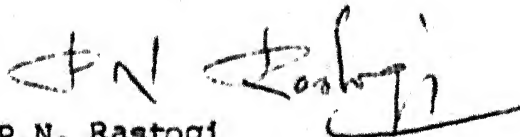
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# SYNOPSIS

of the  
Ph.D. Dissertation  
on  
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The lexicon is one of the least understood components of linguistic theory in spite of the central role it is expected to play as the meeting point of form and meaning, the significance of this role for the patterning of language not having been accorded the recognition it deserves. In the absence of any universally accepted definition of lexicon, it has been necessary to first arrive at a working definition. This definition is based upon the universally accepted necessary notion that the lexicon is a storehouse of the idiosyncratic information in a language; but has been further enriched by considering various functions that in our opinion the lexicon must perform.

Various issues in linguistic theory concerning the functions and organisation of the lexicon have been identified, the solutions available within various theories have been examined, and the adequacy of their lexical description to describe and explain the data has been assessed.



We have presented a case in favour of a lexical description which not only includes semantic information, but also structures this information in such a way that it is readily available to the user for both understanding and producing words and utterances. Our examples have been taken extensively from word-formation, homonymy and polysemy and some other usages in Hindi to show that the only adequate explanation for them can be given in semantic terms.

We find that the most effective technique for the representation of semantic information is one in which meaning is defined as a system of components, an assumption which is basic to the technique of componential analysis. Our study of the various methods employed for semantic analysis shows how they all reduce to this basic assumption about meaning. Therefore, in conjunction with our arguments in favour of a lexical description within the generative semantic framework, we have also presented a justification and defence of the technique of componential analysis, and have demonstrated its usefulness by studying its application to the description of the "creative" aspect of the lexicon, especially word-formation processes and transfer of meaning in metaphorical use.

For our purposes we have examined the semantic and morphological aspects of the lexicon only, and taken examples from Hindi, English and occasionally from Sanskrit.

The first chapter gives our definition of the role and functions of an ideal lexical description, identifies the issues in linguistic theory regarding the organisation of the lexicon, and suggests that a possible solution to them might lie in the structuring of lexical information in semantic terms.

Chapter II examines the Descriptivist School of American Linguistics with a view to showing how its attempt to adequately describe language is seriously impaired because of the exclusion of semantics from the domain of linguistic study. The limitations of the taxonomic, observational theories of language have also been pointed out, together with the effects of such limitations on the formulating of lexical descriptions.

In Chapter III evidence is presented from the field of anthropological linguistics in favour of incorporating meaning in an account of lexical description. The varying degrees of importance assigned to meaning are traced in the explanatory theories of Sapir, Malinowski and Firth. We have also shown in this chapter how the technique of componential analysis came to be developed by anthropologists studying terminological systems, and demonstrated how this technique has come to be the most widely used technique for semantic analysis, because of its relevance for the understanding and characterizing of the lexicons of languages.

In Chapters IV and V we have discussed transformational generative grammar (TGG) and generative semantic (GS) theory respectively. Here it is argued that a lexical description set up in accordance with the goals and assumptions of GS is to be preferred to a lexicon formulated within TGG, because of the inherent inability of the latter to perform all the functions an adequate lexicon is expected to perform. /

The goals of a GS theory are basically compatible with the requirements of a lexical description, and since its assumptions are closely paralleled by the assumptions of componential analysis, we have attempted to present a convincing case for the adequacy of a lexical description which is characterized within such a framework. We have shown that the GS explanations of the creative function and the open-ended nature of the lexicon seem more plausible and natural, and are closer to the goal of psychological reality than explanations within TGG - which at best seem to be highly contrived and artificial.

Finally, an appendix has been included to show how computer-based natural language understanding systems structure lexical information in accordance with the functions assigned to the lexicon. It is seen that their definition of the lexicon and its role in linguistic theory is closer to that of the GS theory than to the concept of the lexicon as defined by any other theory we have discussed.

"It was as though a pattern, perfectly visible, was woven into a piece of material and yet, although he was holding the piece of material, he could not see what the pattern was .... The pattern was all there. It only needed cohesion."

- Agatha Christie

in 'Mrs. McGinty's Dead'.

## CHAPTER I

### INTRODUCTION

#### 1.1. Motivation for Lexicon:

The present work is a study of a very important but somewhat neglected component of linguistic theory - the lexicon. It would be convenient if at the outset we could provide a definition of the lexicon, but it is a measure of the neglect suffered by this component that so far no one definition for it has been agreed upon by linguists. This neglect is due to the fact that the role required of the lexicon as a component in linguistic theory has never been fully realized, and there has not been sufficient appreciation of the significant contribution it has to make to the patterning of language. Therefore, to build up our definition of lexicon, we will start from the minimal definition which is universally accepted and show how the rest of its functions follow from the acceptance of this definition.

All natural languages are characterized by a very large number of lexical items which combine in various ways to form the sentences of the language. These items, and the associated information about them to show how they fit into the language system, cannot be reduced to a finite and manageable number of categories and patterns; hence the only way they can be made available to the speaker is by

listing them somewhere in a language description. This idiosyncratic information, which cannot be predicted by means of general rules but must be learned, comprises the lexical items of the language and the sets of words which function as unitary lexical items, together with the syntactic, semantic and phonological specifications of each. Theories of grammar that attempt to describe a native speaker's knowledge of his language must, therefore, incorporate some component that will serve as a storage for this learned information. The lexicon is the storage component proposed for this purpose; and, it can be considered a theoretical necessity, for the idea of such a component can be detected in all theoretical frameworks attempting to explain the language phenomenon.

## 1.2. Function of the Lexicon:

As a rule linguists have shown a marked unconcern for the issues involved in the construction of a comprehensive theory of the lexicon, so much so that what exactly are the functions of a lexicon in a linguistic theory is also a subject for controversy. In this section we will set out what we consider to be the requirements of an adequate lexical description.

- (1) The lexicon must provide an inventory of all the idiosyncratic items of the language, for the reasons mentioned in the preceding section. But a lexicon

which serves as a mere inventory will at best be adequate for those language theories which aim only at providing a finite mechanism for the production of all the syntactically well-formed sentences of the language. Hence, for a theory to be explanatorily adequate,

- (2) The lexicon must also describe the interrelationships amongst the items listed in it. For our use of language is controlled to a very large extent not only by our knowledge of the lexical items and the features involved in a descriptive definition of each, but also by how the items behave with respect to each other, and the environments in which they are capable of occurring. This knowledge is an integral part of our linguistic competence and hence should have its counterpart in the lexicon of a language theory. It is thus the task of the lexicon to supply an explanation for the various language phenomena, like contradiction, entailment, paraphrase, anomaly etc., which fall within its purview by virtue of being triggered by the properties of the lexical items involved.

Apart from storing information the lexicon should also provide the means for putting this information to use, by making it readily acceptable to the user. Easy recall of information is then necessary if the



lexicon is to be made use of appropriately to do the kind of things with sentences that people normally do in using language. For example: construct an ambiguous sentence, make one sentence follow logically from the other etc.

- (4) An adequate lexical description must be capable of providing active help in the generation of sentences. For when we use language, we start with some idea of what we want to say, cast about in our repertoire of information for the appropriate units, and then arrange them according to the rules of syntax for effective communication.
- (5) Finally, the lexicon must account for the "creativity" of language. That is, it must provide an explanation for the word-forming competence of a native speaker which enables him to form a new word according to the systematic possibilities of his language, if it is required by his communicative needs. It must also explain his ability to use familiar words in metaphorical senses.

These then are the functions of an adequate lexical description. They have some important implications for the organisation of the lexicon.

(1) and (2) imply the presence of an enormous amount of information in this component. Therefore if function (3), that of easy recall, is to be successfully



discharged, introducing structure in the lexicon becomes necessary. That is, statements of regularities, of the systematic relations holding amongst items, must be made. Structuring of lexical information is also necessary for (5), since it implies making use of the systematic possibilities of a language. Function (4) necessitates that structuring be governed by semantic cues, for one is interested in how an acceptable sentence is created, not just in interpreting it, or in judging the grammaticality and acceptability of one which is already created. For the lexicon is required to help in choosing those words which fit with what we want to say in a sentence.

In the light of the requirements set out in this section, the lexicon emerges, not as an isolated component, but as one which is closely related to other levels of linguistic description. It can be said to have a unifying function, although it is itself the least unified and least organized part of any linguistic model, and has, so far, the weakest theoretical basis. However, the lexicon as a theoretical concept is basically unquestioned, and there is more or less universal agreement on what should constitute the data for this component.

### 1.3. Issues Concerning the Lexicon:

Any proposed lexical description can fail in two ways: it may be internally inconsistent with the aims

and assumptions of the theory within which it is formulated or, at a more general level, it may not be adequate for fulfilling all the functions an ideal lexicon is expected to fulfil. The specific problems of the lexical descriptions provided by the various theories we have included in this work will be discussed alongwith the theories in later chapters. Here we will identify the more general problems faced by a theory of the lexicon.

(1) Is the lexicon a single component? :

The issue of whether the lexicon is a single monolith of information or whether it is divided into sub-components according to the different kinds of information it stores is an important problem in lexical theory, because the ability of the lexicon to provide for easy recall, and to explain creativity depends upon how economically lexical information is structured. Also, so far, no agreement has been reached as to how even the lexical entry is to be represented in the lexicon.

(2) Regularities in the lexicon:

Another point of dispute that arises as a direct consequence of (1) above is the question: should there be any grammar in the lexicon? And if so, what should be its scope?

The whole lexicalist-transformationalist controversy is centred round this issue of regularities in the lexicon;

for, even if one adheres to the simplistic definition of the lexicon as an inventory of irregularities, one is faced with the problem of classifying items, like compounds, which are regular products of grammatical rules in some respects, but are idiosyncratic in others. Besides, as we have seen, an adequate lexicon must necessarily be structured, which means that it must include statements of regularities.

It may be argued that these regularities can just as well be included in the grammar, thus maintaining the validity of the definition of the lexicon as an inventory of irregularities. There is a difference in kind between the regularities to be included in the lexicon, and those that form part of the syntactic component. The lexical rules are only partially productive in the sense that they apply only to a few of the cases to which in theory they are applicable (Leech 1974). Also, as we shall show in Chapter V, the most effective formulation of lexical rules is in terms of semantic components and not syntactic categories, as is the case with the fully productive rules of syntax. Hence, within this broader interpretation, the earlier characterization of the lexicon as a store of idiosyncracies, remains largely valid.

### (3) Semantics and the lexicon:

Meaning seems to most naturally enter linguistic through the lexicon, since the word forms the meeting

that the problem of maintaining a distinction between syntax and semantics becomes most pronounced. Should a separate dictionary be posited to store semantic interpretation or should the scope of the lexicon be broadened to include it? And what role should semantics play in the organization of the content in the lexicon? In accordance with their theoretical constraints, different theories accord varying degrees of importance to this problem, but no model of linguistic competence can afford to ignore semantics.

#### (4) Polysemy and homonymy:

A consequence of accepting that some regularities should be reflected in the lexicon, and that semantic relations must form a part of its content, is the need to distinguish between homonymy and polysemy. There are many problems in trying to formalize the notion "relatedness of sense" which is the sole basis for the distinction between the two. The problem is a nontrivial one, because if the lexicon is to be structured so as to permit easy recall, it will be worthwhile to explore the usefulness of polysemy as an organisational principle for such structuring. A lexicon which explains language use, must in part function as a thesaurus as well.

#### (5) Creativity and the lexicon:

The process of lexical invention, or metaphorizing, is not always rule-governed, and may involve a change in

the syntactic property of the item concerned, alongwith some semantic shift. The problem then is, how can this kind of creativity be naturally accounted for in the lexicon? For it is a built-in constraint of a theory of rule-governed creativity (the rules being formulated in syntactic terms) that it cannot be expected to explain instances of "rule-changing" creativity (which necessarily require an explanation in terms of semantic tokens).

The problem cannot be dismissed on the grounds that it is a manifestation of performance and hence outside the scope of a lexical description, for it reflects a speaker's ability to utilize the systematic possibilities of his language. Here, then, is another live issue in lexical theory which must be given its due share of attention.

#### 1.4. Present Work:

The present work will examine the theory and techniques underlying lexical description in various linguistic theories, keeping in mind the issues set out above. The theories examined differ vastly from each other with regard to their basic assumptions, their methodological commitments, and their view of the place and function of the lexicon in a grammar. We will tend to favour that theory which can account for a larger amount of data, and which keeps in view the considerations of simplicity and psychological reality; which tries to account for language as it is, instead of what it should be.

This study will attempt to draw up some kind of coherent picture of the kind of problems the different theories face with regard to the lexicon, the solutions they have proposed within the constraints of their respective theoretical frameworks, and assess the adequacy of these solutions in the light of the functions mentioned in 1.2.

By means of comparison and illustration, we will show that no account of lexical description can be adequate unless it takes meaning and the various kinds of lexical relationships into account. In accordance with this aim we will trace the progressive development in language description toward explanatory theories, and towards the inclusion of meaning as an important part of linguistic study. And we will show how such development was motivated to a large extent by the needs of the lexicon.

We have not taken into consideration the phonological part of the lexicon, for the characterization of phonological information in a lexical description does not seem to have occasioned much dispute. Nor has it played a crucial role in necessitating the reformulation of the lexicon.

The technique which is most widely used for semantic analysis and consequently for lexical description, is that of componential analysis (CA), which treats words as analysable entities and analyses them in terms of semantic markers or components. We shall examine to what

extent and how profitably it has been made use of by the various theories, and shall present a justification and defence of the technique, in conjunction with our arguments in favour of a lexical description within the generative semantic framework. It will also be incidentally apparent that the various solutions of word-formation and other lexical phenomena like productivity, creativity, metaphor, if they are at all convincing and explanatory in nature - are essentially the product of the technique of CA.

Finally, this study of lexical description will unambiguously support the contention that too often linguists have treated man, the language user, as though he were a passive grammar filter; whereas in reality, in his production of language, as in his interpretation of it, he is active and creative.

#### 1.5. Chapter-wise Summary of the Thesis:

Chapter II, will examine the Descriptivist School of American Linguistics with a view to showing how its attempt to adequately describe language is seriously impaired because of the exclusion of semantics from the domain of linguistic study. We will also point out the limitations of the taxonomic, observational theories of language, and the effects of such limitations on the formulating of lexical descriptions.



Chapter III will present evidence from the field of anthropological linguistics in favour of incorporating meaning in an account of lexical description. The varying degrees of importance assigned to meaning will be traced in the explanatory theories of Sapir, Malinowski and Firth. We will also show how the technique of CA came to be developed by anthropologists studying terminological systems in an attempt to gain deeper insight into the associated cultures; and demonstrate how CA, because of its relevance for the understanding and characterizing of the lexicons of languages, has come to be the most widely used technique for semantic analysis.

Chapters IV and V will be devoted to the discussion of transformational generative grammar (TGG) and generative semantics (GS) respectively. We will argue in favour of setting up lexical descriptions in accordance with the assumptions and goals of GS, by showing up the many shortcomings of a TG lexicon, and by establishing its inherent inability to perform all the functions an adequate lexicon is expected to perform.

The goals of a GS theory are basically compatible with the requirements of a lexical description, and since its assumptions are closely paralleled by the assumptions of CA, we expect to be able to present a convincing case for the adequacy of a lexical description which is characterized within such a framework. We will specifically study



the lexical phenomena of word-formation, homonymy and polysemy and, to a more limited extent, metaphor, and show that the GS solutions to these problems seem more plausible and natural, and are closer to the goal of psychological reality than solutions within TG - which, at best, seem to be highly contrived and artificial. We will illustrate our case with examples from Hindi, English, and occasionally from Sanskrit.

We felt that it would be instructive to see how lexical information is handled in the computer-based natural language understanding systems. For this reason an appendix has been included to show how such systems structure lexical information in accordance with the functions assigned to the lexicon. It will be seen that their definition of the lexicon and its role in linguistic theory is closer to that of the GS theory, than to the concept of the lexicon as defined by any other theory we have discussed.

## CHAPTER II

## DESCRIPTIVE LINGUISTICS

## 2.0. Introduction:

In this chapter we will discuss what has come to be known as the Descriptive School<sup>1</sup> of Linguistics. Sapir in his Language (1921) and Boas to a limited extent before him, had done much to divorce linguistics from the comparative and historical approach to the study of language, and place the discipline on some kind of scientific footing - to show that its central concerns should be with the making of "scientific" descriptive statements. Bloomfield hailed the attitude with approval and struggled constantly to extend both a scientific analysis and a scientific statement of results to the whole range of linguistic knowledge.

And in this respect he had, in the judgement of some, his greatest influence upon his followers. For he not only asserted that linguistic science is possible but also defined a direction for it to take - and this resulted in Descriptive Linguistics.

For our discussion of Bloomfield we refer mainly to the theory of language he developed in his book Language (1933), a theory which, together with some of the views he had expressed in 1926, formed the basis for a later modification into a theory which has since come to be known as Post-Bloomfieldian theory. But this was not the sole

development of Bloomfield's work, as we shall show in the course of this chapter.

## 2.1. Bloomfieldian Theory :

### 2.1.1. The Delimitation of Data :

Bloomfield does not take a very rigid and inflexible stand on anything he proposed. But one technique he finds particularly unacceptable as a basis for theory construction is the "mentalist" approach to data, the use of introspection to arrive at "ideas" and "concepts", which can then be used as primitives on which to base the definitions of a theory. Bloomfield is concerned with achieving scientific explicitness in his statements and definitions and hence selects his primitives in accordance with their amenability to interpretation and testability. So much so that the data of his theory are in part determined by what is considered to be an acceptable scientific statement. This is probably one reason why meaning is left out of consideration in his theory even while its relevance in a study of language is recognized and acknowledged. Bloomfield never denied the use of meaning in linguistic analysis :

"Only by finding out which utterances are alike in meaning, and which ones are different, can the observer learn to recognize phonemic distinctions" (Bloomfield 1933:93); and again -- "Only in this way will a proper analysis (that is, one which takes account of the meanings) lead to the ultimate constituent morphemes" (1933:161).

But he insisted that meaning cannot be used for definitions since it was difficult to give a scientifically accurate definition of meaning for every form of language. There were no techniques available to formally classify and analyse meaning as there were for analysing grammatical and morphological forms.

This anti-mentalist, pro-mechanist bias led Bloomfield to impose some kind of restriction on the possible data of his theory. His approach to theory construction was to choose, whenever possible, those primitives that resulted from non-linguistic operations, and which could thus guarantee some kind of interpretation of the accountings and their possible invalidation. This was essential since a theory had to be open to testability. But it was not because he restricted himself to particular kinds of primitives that he restricted his data. It was the fact that he designated certain operations as unacceptable (hence also the primitives that result from such operations), that caused the limitation of what could qualify as possible data. Introspectively acquired data and primitives are thus disqualified.

Now, in human speech, different sounds have different meanings and to study the coordination of certain sounds with certain meanings is to study language (1933:27). A speech act can be schematically represented as follows:

$$S \rightarrow r \dots s \rightarrow R$$

S = stimulus to speaker

r = verbal response of speaker

s = hearer's perception of verbal articulation

R = hearer's physical response to verbal stimulus.

The r....s portion is the speech-act and is the subject matter of linguistics since it can be subjected to scientific treatment. The S and R portions are collectively the meaning of the speech signal (1933:32). A patterned relationship is assumed to exist between the speech signal and the meaning.

This view of language, that it is essentially an activity of human beings within an environment, means considering language as some kind of behaviour instead of some kind of innate knowledge. As introspection would be one of the techniques required to arrive at the patterns exhibited by this knowledge, Bloomfield rejected it as we have seen, thereby subscribing to the view that is known as mechanism.

Keeping this in mind, we will now examine Bloomfield's theory with special reference to the lexicon and trace its influence on later linguists of the school. For though the lexicon as a component does not receive detailed attention, it is closely interlinked with Bloomfield's treatment of grammar and morphology in his theory.

### 2.1.2. The Lexicon in Bloomfieldian Theory:

Of all the linguists who come under the rubric of Descriptive Linguistics, Bloomfield is the only one who has a comprehensive view of the lexicon. His primary concerns were the grammar and morphology of a language and he did not devote much thought to the lexicon as a component, looking upon it only as a necessary adjunct to grammar. But from the many references he has made to it throughout his work, it is possible to construct a fairly comprehensive picture of the lexicon in the light of the major tenets of his theory - and to characterize the role it plays in the theory.

It is important to realize at the outset that the relation between sound and meaning is assumed. Since we have no way of defining most meanings, we have to take the "specific and stable character of language as a presupposition of linguistic study." It is not possible to demonstrate the pattern holding between r...s and S/R and it was this that motivated Bloomfield's fundamental assumption:

"In certain (speech) communities, some speech utterances are alike as to form and meaning" (1933:144).

But although Bloomfield admitted that in linguistic science it was not possible to determine the identity between form and meaning, he justified his assumption by claiming that if some other science could define some meanings e.g. those of male, female, then the linguist could use these to tell the difference between he:she; lion:lioness; boy:girl etc.

In many cases the linguist can confidently make this assertion on the basis of some recognizable phonetic or grammatical feature which groups a number of the forms of a language into form-classes. And in any one form-class, every form contains an element called the class-meaning, which is the same for all elements of this form-class, e.g. all English substantives belong to a form-class which has a meaning that could be designated as 'object'; and it is further divided into the classes of singular and plural. A unique feature of every language is a class of forms called substitutes (e.g. pronouns) whose meaning consists largely or entirely of class-meanings (1933:145-6). Thus we see that each grammatical category has a functional 'meaning' and if at all meaning enters the lexicon, it is in this capacity.

The dictionary is considered as separate from the lexicon, the latter being a purely theoretical device, whose structure is subject to the mechanistic and operational bias of the theory. Bloomfield mentions the association between a normal phonetic form and a stable dictionary meaning and discusses the complexities of the latter (1933:148) under the two main headings of transferred meanings and connotations. But he does not relate it to his theory or show how this information is formally incorporated into it.

All complex forms (complex words and utterances) are made up entirely of morphemes. Hence a complete list of morphemes would account for all the phonetic forms of a language. But the meaning of an utterance cannot be accounted



for solely in terms of the meanings of its constituent morphemes, since every utterance contains some significant features that are not accounted for by the lexicon, which only accounts for the characteristic features of each morpheme. "Every language shows part of its meanings by the arrangement of its forms" (1933:162).

Thus an accounting of the patterning of forms consists of two portions: (1) statement of constructions (i.e. the linear order of the arrangement of forms) and (2) lists of forms in positions (these positions being defined functionally as form-class) (Davis 1973). It is these two patterns that are labelled grammar and lexicon respectively. According to Bloomfield the two together constitute the semantics of a language: "when the phonology of a language has been established, there remains the task of telling what meanings are attached to the several phonetic forms. This phase of the description is semantics" (1933:138).

The structure of the lexicon, the way the morphemes in it are listed, is governed by the criterion of simplicity for the test of a good theory is that the accounting it yields should provide the simplest description of facts. For instance, a number of words are inflected (and very often the inflecting morpheme is an indicator of its form-class). A morphological analysis of the word would give a basic form and the inflectional morpheme - which may be and usually is common to several complex forms.



E.g. thick + ness

(The inflectional morpheme '-ness' is also found in many other complex forms: flatness, illness, fatness etc. and can be said to have the class-meaning "quality").

Then according to the simplicity criterion, to obtain as uniform a statement as possible, that form or morpheme will have to be selected as the basic alternant, which will enable us in the long run, to get the simplest description of facts (1933:164). These basic alternants form part of the content of the lexicon, the inflected morpheme being covered by a general statement. However, there are some irregular forms which are not covered by the general statement, e.g. go + pl → went. These too have to be listed and are hence entered in the lexicon; though, of course, the aim is to arrange the description so that as many forms as possible are included in the general statement (1933:213, 274).

We have been looking at the relation of morphology to the lexicon. Now let us look at the lexicon proper. Strictly speaking every morpheme of a language is an irregularity and the reader of a linguistic description can know of its existence only if it is listed for him. This is all the more apparent when meaning enters the picture, since the meaning of each morpheme is an arbitrary and unique property. Further each morpheme is arbitrarily assigned to some grammatical class - form-class. Since this feature is also an irregularity, this task too is customarily assigned to the lexicon - the lexicon being looked upon as a mere appendix to

the grammar, a non-linear conjunction of the minimum forms of a language. "All forms having the same functions (occupying the same positions) constitute a form-class" (Bloomfield 1926:159). The form class of a word can be determined either by the inclusion of a special constituent (a marker) or by the identity of the form itself i.e. an arbitrarily assigned form-class which is listed in the lexicon alongwith the item (1933:268). However, form-classes are not mutually exclusive, but cross each other and overlap and are included one within the other etc. (for examples cf. 2.3.1.1). The lexicon is thus additionally structured by the fact that form-classes themselves may have internal organisation.

For example both "mayor" and "letter" are nouns and occur in the same position in the constructions

- (1) The mayor falls.
- (2) The letter falls.

Yet one of them yields an ungrammatical sentence when used with the verb "trips":

- (3) The mayor trips.
- \* (4) The letter trips.

This is because the form-class Noun is itself divided into the subclasses of Noun animate and Noun inanimate. This type of data introduces into the structure of the lexicon the notions of subclasses and selection relations (1933:165). It is this latter consideration operating within language that dictates the choice of an animate noun with the verb 'trips',

... .. regardless of whether it is

animate or otherwise. This type of selection is called 'government'; the accompanying form 'trips' is said to govern, or to take the selected form 'mayor' (1933:192). That is, in addition to specifying the form-classes of the listed forms, the lexicon must also provide their lexical and grammatical features.

Since this kind of cross-classification and class-cleavage is characteristic of the lexicon, the pattern imposed on the morphemes in it is not a taxonomic hierarchy, like in Bloomfieldian grammar. Two forms may belong to the same subclass and yet be separated with respect to another subclass. E.g. "Mayor" and "letter" are both Noun Singular yet the former is an animate noun and the latter inanimate. Therefore the morphemes are randomly listed, and each member has its form-class and subclass membership as part of its entry in the lexicon. These properties of morphemes are as idiosyncratic and non-patterned as are its meaning and phonological shape (1933:274).

An important point to note here is that features like Animate, Plural, Human etc. are 'subcategorical' in nature. They divide the major form classes (or parts of speech) into subclasses which are of grammatical significance. They cannot be semantic features constituting the 'meaning' of the item -- Bloomfield having stated in several places that there are no valid techniques for analysing meaning, and hence the job of definition of morphemes is best left to the dictionary, until the time when such techniques become available in

linguistic theory. As we shall see in Chapter IV, the lexicon of transformational grammar is very similar to that of Bloomfield's, and one of the criticisms levelled against it is that the above kind of features - human, animate etc. are actually semantic in nature and not syntactic, even though they are of immense syntactical significance in enabling one to decide whether a construction is acceptable or not.

Another major point in this discussion of Bloomfield's lexicon is the observation that the distinction between grammar and lexicon is not one of levels. A level is defined as a domain that requires a specific kind of pattern to describe it. The distinction between morphology and syntax is made according to the domains they deal with. That is, the patterning of forms within the domain of the word is morphology, and the patterning of words within the domain of the phrase is the subject of syntax. The two domains are part of a taxonomy and the relation between them is one of made-up-of. Both domains, moreover, are described by the same kind of pattern, the only difference being that the patterns of words are more "rigidly fixed" and more statements of selection are required (1933:207). The difference in patterning is one of degree, morphology being the description of constructions in which bound forms appear among the constituents. Thus morphology and syntax do not correspond to two distinct levels. Since the patterns of morphology are the only patterns in the lexicon, and the morphemes grouped in the lexicon constitute terms whose patterning is

expressed by the grammar, it is safe to conclude that the two patterns in Bloomfieldian theory form integral parts of a single pattern i.e. grammar and lexicon constitute a single level.

The requirements of the lexicon however, led Bloomfield into making use of "processes", and overlooking to some extent the rigid theoretical principles of a taxonomic operational theory. A taxonomic theory is characterized by patterns based on relations of selection, made-up-of, dependence. But the decision to enter morphemes in the lexicon in terms of a basic alternant, in some cases, so as to achieve greater simplicity in the accounting, bring certain kinds of relations into the picture which do not conform to the requirements of an operational theory. For example, in the case of "knife" and "knives": singular [naif] and plural [naiv + z]. We can describe the peculiarity of such a plural by making a statement saying that "the final [f] of the underlying singular is replaced by [v] before the bound form is added" (1933:213). The terms "before" or "after", as the case may be, tell the descriptive order - but the descriptive order of grammatical features is a fiction and results simply from the method of describing forms i.e. it is a descriptive convenience, an abstraction that does not correspond to anything in the data. The relations of replace, add, delete which are used in the statements to derive forms from basic alternants are different in nature from those mentioned earlier - in that such relations hold between taxonomies (Davis 1973:119). They

state the correlation between the taxonomy that is defined in terms that represent basic forms, and the taxonomy that represents the actual shapes of forms as they occur in data. This correlation is never defined in terms of made-up-of and is therefore non-taxonomic - and process oriented. The relation of grammar-lexicon to phonology is however still one of made-up-of. But the absence of realism reflected in Bloomfield's use of the notions of "process" and "descriptive order" makes his theory incompletely operational and we shall now briefly examine some further evidence which supports this conclusion.

## 2.2. Operational Vs. Explanatory Theory:

An important characteristic of an operational theory is that whatever terms and definitions it makes use of in an accounting can be determined to exist within data by means of applying a set of handling techniques i.e. their existence can be verified operationally outside the bounds of the theory. Nothing is assumed or kept undefined. However, the degree of operationalism may vary. A theory may take an extreme position and be mechanically operational, in which case the operations will have to be sufficiently constrained to yield only a single description when applied to data. Or a theory may adopt a weaker version of operationalism and allow its operations to yield more than one accounting. This opens the possibility of applying evaluative criteria to choose the better accounting, in the manner of an explanatory theory, a possibility denied in the former case.



Bloomfield's theory adopts the latter version of operationalism since he is concerned with making linguistic theory scientific in nature, in which case it should be open to testability and invalidation. Also, Bloomfield strongly favours an accounting which yields the simplest description of data. Further, Bloomfieldian theory is not constrained by "realism" to the same extent as was Saussurean theory, which required all the terms of the accounting to correspond to some portion of data. The theory is constructed to express patterns assumed to exist in data, but not all of its terms can be physically verified, as we shall show. Bloomfield, however, did believe that a theory should ideally be an operational one; but since the techniques required to make it so - analysis and recording of meaning - were not available, his theory is, in parts, reluctantly explanatory.<sup>2</sup>

"So long as the analysis of meaning remains outside the powers of science, the analysis and recording of languages will remain an art or a practical skill" (1933:93).

This being so, the assumption of identity in Bloomfield's fundamental assumption of linguistics: "In certain communities (speech communities) some speech utterances are alike as to form and meaning", (1933:144) breaks the bounds of the constraints of operationalism. Davis (1973: 108-10) discusses the status of the notions of 'identity' and 'distinctiveness' with a view to classifying Bloomfield's theory. We will only summarize his conclusions here.

Davis first examines the way in which accountings are written in Bloomfieldian theory, based on the assumption of an identity relationship. Identity and distinctiveness may enter the theory as primitives (they are assumed) if the accountings are made arbitrarily and then evaluated against some criteria like simplicity and generality. In this case the theory will be explanatory. On the other hand, the relationships may enter as definitions and thereby be constrained to correspond to some operations that can be performed on the data. Bloomfield makes an attempt to characterize "distinctiveness" in his definition of the phoneme, and then outlines an operation to compare different sounds (1933:77-79).

"Part of the gross acoustic features are indifferent (non-distinctive) and only part are connected with meanings and essential to communication (distinctive)."

But this definition itself assumes several things, the most relevant here being the assumption of a record of meaning analogous with the record of vocal data. For only by finding out which utterances are alike in meaning and which ones are different, can the observer learn to recognize the phonemic distinctions.

The techniques intended to yield information about identity in grammar and morphology are even less formalized, and identity and non-identity are nowhere defined. All we are given are imprecise directions on how to recognize them in specific data.



Further, as pointed out earlier, Bloomfield's use of processes and descriptive order in morphology fall outside the scope of an operational theory.

The only conclusion possible in view of all this is to treat Bloomfieldian theory as incompletely operational and tending towards the explanatory mode of accounting. These two conflicting trends in Bloomfield's theory were separately developed by his followers. In the following sections, which will deal with Post-Bloomfieldian theories, we shall trace the development of these trends and determine their influence on the structure of the lexicon and its role vis-a-vis grammar in the resultant theories.

### 2.3. Post-Bloomfieldian Theories:

#### 2.3.1. The Operational Strand in Post-Bloomfieldian Theory:

As we saw in Section 2.2 the assumption of identity as a primitive led to the ambiguous classification of Bloomfieldian theory. Subsequent development of the theory is characterized to a great extent by the attempt to introduce identity vs. non-identity as definitions, thus sharpening the operational constraint of the theory. To do this Post-Bloomfieldians introduced operations like complementary distribution and free variation vs. contrast, which were based exclusively on distributional information about elements.

Post-Bloomfieldian theory is in fact not a single theory but a cluster of theories based on the work of Bloomfield. What they share is the attempt to make linguistic

theory as operational as possible. An important constraint on an operational theory is that the order of definitions in the theory should parallel the sequence of the operations that are performed on data. Bloomfieldian theory violates this constraint, since in places its definitions presuppose operations that are yet to be performed. Post-Bloomfieldian theory is concerned with the elaboration of operations assumed by Bloomfield, while simultaneously maintaining a strict parallelism between the order of definitions and the sequence of operations. The data of both theories remain the same - the analysis of the invariant structure of language as it exists, in terms of a set of statements. Meaning still remains outside the scope of linguistic study, for as Hockett (1948) maintained, structural analysis can be scientific without being semantic.

Before proceeding further we would like to point out a circularity in their method of analysis. Post-Bloomfieldian theory emphasises the operational constraint on a possible theory to the extent that it should always be possible to attain an accounting via the operations it sets out, though in actual practice they could use whatever means they found useful in reaching an accounting. It is just that each accounting must be one permitted by the theory; "how we find it, by whatever short cuts, is our business" (Bloch 1948:5). Thus the use of meaning, of grammatical information in phonemic analysis etc. are only theoretically

outlined later, after the results of the operations have been otherwise obtained. The circularity and lack of order they accused Bloomfieldian theory of is thus apparent in their own analysis.

For our discussion we have taken Bloch, Harris and Wells as representative of the operationalist strand of Post-Bloomfieldian linguistics. Broadly classified, the Post-Bloomfieldian theories show two different "directions" of analysis. Bloch's and Harris' technique takes sequences of morphemes and combines them into more inclusive fewer classes via substitution. Wells, on the other hand, with his technique of Immediate Constituent (IC) Analysis takes the same morpheme sequences and divides them into segments until no further segmentation is possible. That is, it works from "top-down" while Harris' procedure works from "bottom up". Both, however, are based on the operation of substitution and neither is mechanically operational in nature since both submit to the criteria of simplicity and economy. Both analyses state the distribution of morphemes, since their purpose is to provide a framework for morphemic (i.e. grammatical) patterning. In the descriptive analysis of any language we are concerned with two primary features (1) the morpheme inventory and (2) the distribution of the morphemes. The so-called grammar of a language here consists largely in describing what kinds of morphemes go together. And, as we saw in Section 2.1.2, if these combinations constitute words, they are described in the morphology; if they constitute phrases, they are described in the syntax.

Post-Bloomfieldians, however, were so concerned with "purifying" Bloomfield's theory and ridding it of its explanatory features, that they quite overlooked his passing concern with the lexicon of a language, its morpheme inventory and how it is to be structured. There is very little reference to the lexicon in Post-Bloomfieldian literature which deals mainly with stating the distribution of the morphemes that exist in a language. For according to the operationalists, Bloomfieldian theory was considered maximally weak with respect to constraint on grammatical patterning. Hence Harris' method involves an operation in which segmentation is performed without recourse to meaning, while Wells' analysis determines operationally stretches of morphemes that exhibit pattern. We shall briefly outline the two procedures and then examine the implications of such an approach for the lexicon.

The operational constraint being the overriding methodological constraint for the analysis of the levels of morphology and syntax, the proper analysis of structure at these levels was required to be the automatic consequence of applying mechanical discovery procedures to a corpus of utterances. This corpus was represented by phonemic transcription i.e. the input to these levels of analysis is provided by the output of the phonemic analysis procedures - the flow of information being unidirectional. Descriptivists accepted the constraint that levels should be separate and that information from a higher level should not be used in the analysis of a lower level.

A corpus in phonemic transcription will of necessity exhibit recurrences of certain phonemic sequences which occur in different phonological environments, e.g. / z / in / d ɔ g z / and / fl ɔ g z /, or / m æ n / in / m æ n l i / and / m æ n h u d /. Some phoneme sequences recur because they represent lexical items in the language. The Post-Bloomfieldians' problem is to segregate these types of recurrences without the aid of the notion of "word", since this would involve presupposing information not already yielded by the application of some operation. Further, they could also not explicit their knowledge that these recurrent phonemic sequences also exhibited semantic stability.

Therefore, in their grammatical analysis also, they had to use the operations of free-variation, contrast and complementary distribution<sup>3</sup> to establish sameness of occurrences, operations which they had set up for phonemic analysis. But at the taxonomic syntax level one finds a more or less tacit abandonment of these principles, for it is discovered that morphemes that belong to a common syntactic type share their privileges of occurrence and are thus not in complementary distribution. In order to make descriptive statements about this in accordance with the taxonomic approach, new principles of construction are required. These are the operations of substitution and expansion used in the two variants of Post-Bloomfieldian theory mentioned earlier. Both Harris and Wells develop rigorous techniques for segmenting and classifying units of utterances based on

their distribution. Harris uses the operation of substitution to isolate morpheme classes which are formed by placing in one class all morphemes which are substitutable for each other in utterances. e.g. "The ---" is a morpheme class and may consist of either single morphemes or sequences of morphemes. However these morphemes (sequences) may differ distributionally with regard to other environments and thus form subclasses of the main morpheme class. Harris' method gives due recognition to the relationship of concord, for in any description of language, if a pattern is there it must be preserved. Harris takes care of this by adding superscripts to the morpheme subclasses, to show that we cannot replace a class of higher superscript with one of lower superscript, but the reverse operation is possible. That is, superscripts are used to indicate unidirectional substitutability (Harris 1946).

Since there is so much cross-classification, Harris' procedure ends up by correlating selected environments (frames) with all the morphemes that enter them, instead of correlating each morpheme with all its environments i.e. the variables are the positions and not the morphemes (cf. examples in 2.3.1.1.).

As Harris (1951:243) puts it, the aim of the whole exercise is to reduce the number of elements in preparation for a compact statement of the composition of utterances, and also to avoid repeating almost identical distributional statements for many morphemes individually. If morphemes are kept as the elements of morphological analysis (as in Bloomfield) we will have a great many identical or almost



identical statements of distribution, each dealing with a different morpheme. Considerable economy can be achieved by making morpheme classes or positions the elements of analysis and assigning to each of them distributionally similar morphemes.

Harris' move was to make morphology look more like phonology - to rigorously classify its patterns. He refused to acknowledge what Sapir and Bloomfield before him had already recognized: that there was more to morphemes than just their distributional peculiarities; something of an essentially different nature called "process" without which morphemes could not be glued together into utterances. It took Hockett (1954, 1961) to point out that morphology and phonology are two essentially different levels, patterned independently of each other.

R. Wells systematically extended Harris' building-block style of description into the higher levels of grammar in terms of immediate constituents. He elaborated upon Harris' operation of substitution and arrived at his notion of expansion, i.e. two sequences of morphemes, insofar as one is an expansion of the other, pattern alike. Its general principle is not only to view a sequence, when possible, as an expansion of a shorter sequence but also to break it up further into parts of which some or all are themselves expansions. IC analysis however, unlike Harris' description, does take meaning into account in some cases and recognizes

the word as an independent grammatical unit.

But a major shortcoming of such operational theories is their overemphasis on methodology and their consequent blindness to the inherent nature of language structure. Post-Bloomfieldians are so preoccupied with describing observable structures and classifying and "taxonomizing" linguistic elements that they do not formalize the syntactical rules obtaining in language and the way these automatically assign structure to infinite sets of sentences. For them analysis is a kind of dissection of sentences into segments with a subsequent classification of these fragments into classes etc., and the criteria are actually just mechanical recipes for this segmentation and taxonomy.

At this juncture we would like to make one point clear. We mentioned earlier that the word is not a relevant unit in Harris' analysis, that in his description of utterances he dispenses with the distinction between morphology and syntax. But this seems to be just a methodological convenience, and it is not meant to deny the existence of correlations between phonemic and grammatical features of morphemes. This correlation is usually cast most efficiently in the form of a word - a fact recognized by IC analysis. But though they differ at this point, both the variants meet the requirements of an operational theory.



### 2.3.1.1. Implications for the Lexicon:

Both the operations, Harris' and Wells', are not mechanical since they submit to evaluative criteria in considering that accounting to be simpler which yields the largest morpheme class (or focus class according to Wells), thus describing a greater amount of data by means of a single statement. Both techniques are based on the operation of substitution, and compare morphemes (sequences) in some position. The outcome is disjunctive substitution classes, hierarchically ordered on the basis of unidirectional substitution, which are linearly related in the grammatical patterning. This kind of accounting requires a morpheme inventory in which the pattern of the morphemes is expressed in terms of classes of morphemes that have the largest possible membership. As we have seen, it was the need to establish identity without the use of meaning that led to this type of inventory.

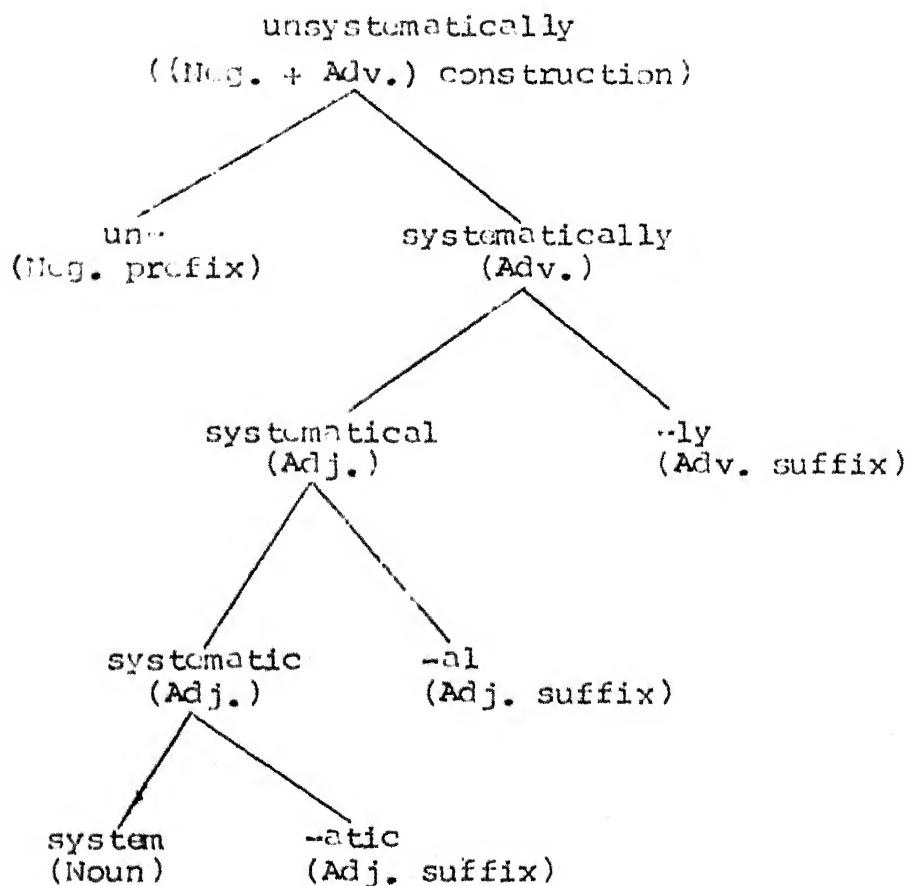
As we pointed out in the foregoing discussion, Bloomfieldian grammar is based on the notion of the morpheme in a position while Post-Bloomfieldian grammar is based on the disjunctive class, in which the morpheme class and not the morpheme is the basis of grammatical patterning. This distinction is clearly reflected in the lexicon. Bloomfieldian theory posits a lexicon in which morphemes are listed once, with their respective form-classes. The form-classes are then listed many times across the lexicon along with the relevant morphemes. The morphemes are taken as the

idiosyncratic unique features which must be listed since they cannot be predicted. The Post-Bloomfieldian lexicon, on the other hand, makes the morpheme class the basic entry of the lexicon. It lists the morpheme classes only once and it is the morphemes that multiply, i.e., the same morpheme may be listed under more than one morpheme class due to class-clavage (explained by partial distributional identity) (Davis 1973).

This is so in the procedure Harris (1951) outlined and which is basic to most Post-Bloomfieldian analyses. Instead of beginning with classes of morphemes having almost identical environments (with each morpheme belonging to only one class), and then adjusting them into subclasses based on partial identity of distributional environments, Harris devises an operation which from the first yields groupings of morphemes which share a common range of environments (Harris 1951:249-50). Some of these classes are very large; others may contain only one morpheme. Many of the classes have morphemes in common, sometimes even environments, but no two classes would have a morpheme in its environment (i.e. an entire utterance) in common. The morphemes are listed in an index under their classes. Such an inventory is useful in that it not only states the morpheme stock of the language, but also the status of each morpheme in the morphology. However, this entails many repetitions of the same morpheme and in order to avoid this to some extent, the inventory should try to

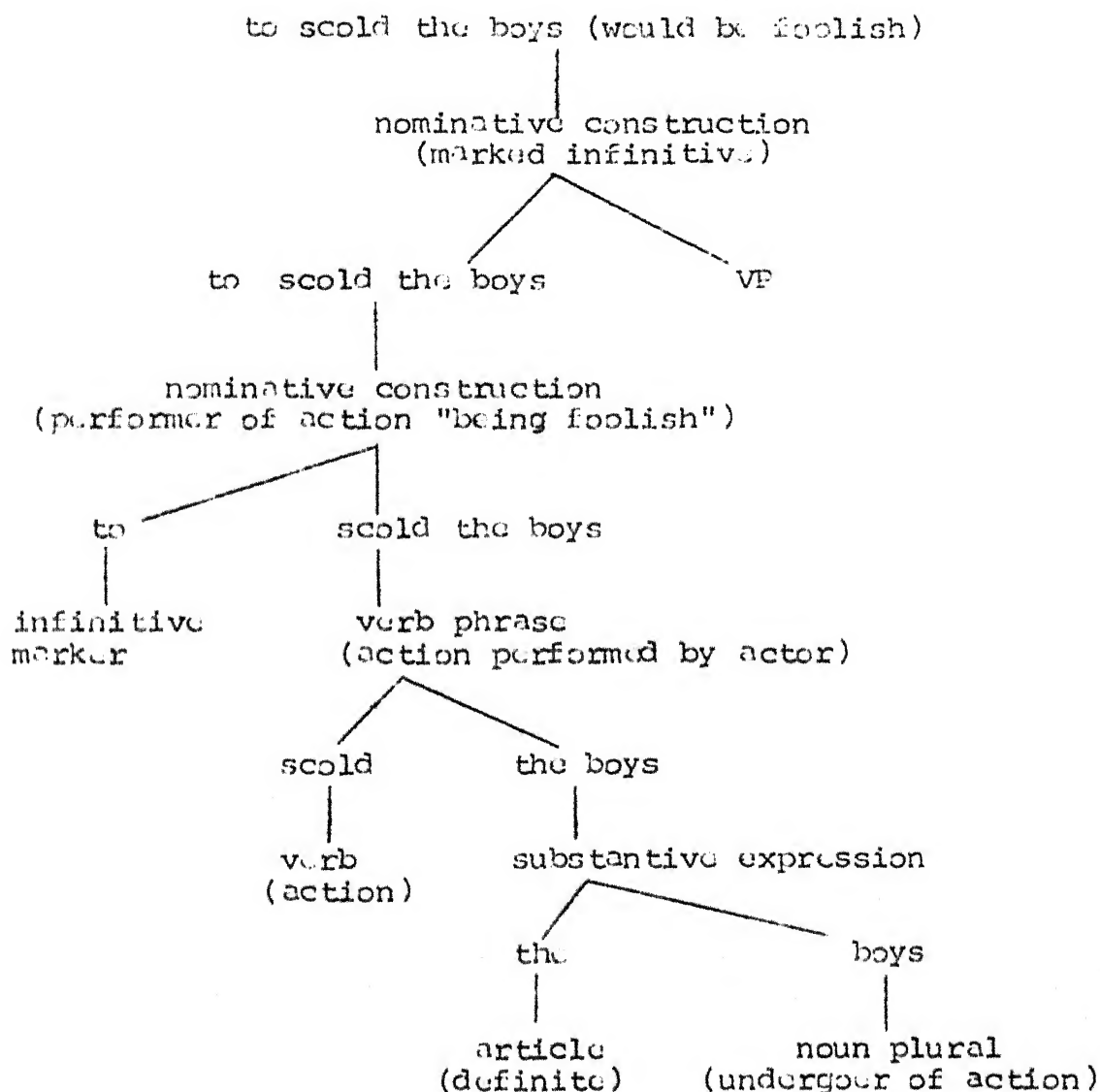
Examples :

(1) Lexical information in Bloomfield's theory :



(This is in accordance with Bloomfield (1933:222) where he states that morphologically complex forms display ranking of constructions and ordering of affixation. The outer layer of such forms consists of inflectional constructions and the inner layer of word-formation: in this case system + atic).

## (2) Grammatical analysis in Bloomfield's theory:



(cf. Bloomfield (1933:267-69): the nominative expressions can include substantives and gerunds, apart from marked infinitives, as in this example; and the class meaning of substantive expressions or forms is 'that which can be the performer of an action, the undergoer of an action, the possessor of objects' and so on).

- (3) Lexical information in Post-Bloomfieldian theory,  
where morpheme classes form the disjunctive sets:

<u>Noun</u>	<u>Adj. suffix -atic, -etic</u>	<u>Adj. suffix -al</u>
{ system drama sense canon }	{ systematic dramatic autocratic }	{ systematical canonical hypothetical focal }
<u>Adv. suffix -ly</u>	<u>Neg. prefix -un, -in, -im, -non</u>	<u>Adjective</u>
{ systematically actually sharply distinctly }	{ unsystematically indistinct nonsense }	{ sharp distinct green pretty }

- (4) Grammatical analysis in Post-Bloomfieldian theory:

<u>Noun phrase</u>
{ Noun Article + N Adj. + N (Article) Adj. + N gerund marked infinitive phrase ⋮ }

(That is, in this case, the various 'frames' of possible noun phrases are identified in a form similar to phrase-structure grammars).

This kind of difference between the Bloomfieldian and Post-Bloomfieldian theories has wider implications than may be apparent at first glance. There is a direct relationship between the kind of theory and the lexicon. The theoretical orientation of a theory dictates the structure and basic elements of the lexicon. As we have set out in Chapter I, the concept of the lexicon as an essential theoretical component, and the data of this component, are issues on which there is more or less universal agreement. But how the lexicon should be structured, and in what terms the relationships among its elements should be expressed, are problems to which different theories have different solutions, depending on what the theoretical needs are.

In the present case, the change in the structure of the lexicon is motivated indirectly by the operationalist constraint on the theory, and directly by the type of patterns that are possible on the basis of the operations devised to satisfy the demands of such an operational theory. Grammar in Post-Bloomfieldian theory is based on the operationally verifiable notion of position, and describes patterns based on substitutions in that position (cf. examples above). To provide for the operationally determined substitutions, the theory requires inventories of disjunctive relationships and classes - and this is where the lexicon comes in. The lexicon was originally a part of the primarily syntagmatic Bloomfieldian theory. But the tightening of the operational

constraints on the theory and the setting up of operations which require disjunctive relationships in turn affected the theory, and thereby the lexicon.

### 2.3.2. The Explanatory Strand in Post-Bloomfieldian Theory:

Pike is not normally discussed as a Post-Bloomfieldian linguist, his contribution to the field having been awarded an individual status, namely, Tagmemic Theory. But the development of tagmemic theory paralleled that of what we have termed the operational strand of Post-Bloomfieldian theory, and both followed from and were influenced by Bloomfield's Language (1933). Both are basically descriptivist accounts of language and view the language phenomenon in the tradition of Bloomfield as a behavioural activity. But Pike's interpretation of language-as-behaviour is wider in scope than that of Harris, Wells etc., in that he not only assumes that verbal behaviour occurs within the broader context of non-verbal behaviour, but he also includes meaning as a relevant structural parameter in the analysis of linguistic forms and assigns to it a pattern analogous to the pattern of the grammatical level etc. Pike acknowledges that he drew some of his ideas and theoretical definitions from Sapir (1927) although Sapir had presented them informally, without realizing the implications of his insights. And as we shall see in Chapter III, Sapir's theory was very much an explanatory account of language. These, in brief, are

the reasons for discussing Pike's theory under the rubric of Post-Bloomfieldian theories.

There are, of course, several proponents of tagmemics (Longacre, Cook, Brend etc.) but Pike's version of tagmemics appears to be the central influence and presents the point of view basic to the school. As has been our practice in the earlier sections, we will not go into the details of the mechanics of the theory, but will merely examine it with a view to establishing its explanatory nature, as opposed to the operationalist bias of the theorists discussed in Section 2.3.1, both versions having basically sprung from the same source.

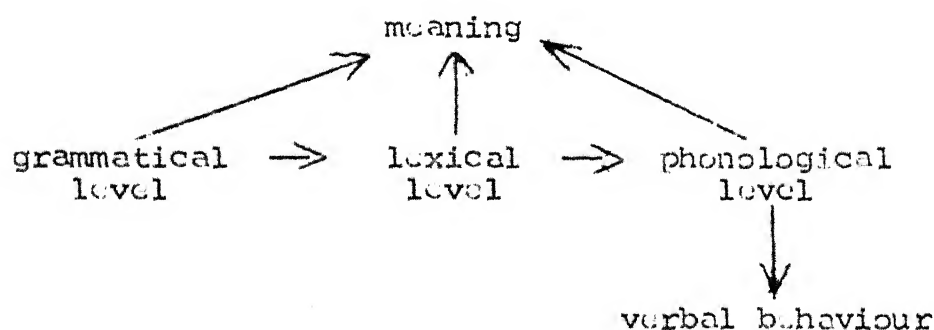
We would first like to elaborate Pike's notion of language as behaviour, since his theory follows from this basic premise. Bloomfield and Post-Bloomfieldians believed language to be the verbal behaviour that occurred within a stimulus-response context. The latter played no role in grammatical analysis, the patterning in language being limited to verbal behaviour. Pike (1967) gives reasons for the need of a unified linguistic theory i.e. one which will not cause a severe jar as one passes from non-verbal to verbal activity. He considers language behaviour as "a phase of human activity that must not be treated in essence as structurally divorced from the structure of non-verbal human activity" (1967:26). Accordingly, he treats non-verbal and verbal activity as an integrated whole, and assumes



similar patterning for both. That is, the meaning may be manifest as either kind of behaviour, as Pike shows with his examples in which gestures replace speech forms without loss of meaningfulness. Language is thus partially defined with reference to its inclusion within a non-verbal pattern, to the non-linguistic context in which linguistic utterances occur. This view closely resembles that of the anthropological linguists discussed in Chapter III.

There are three types of patterns tagmemics accounts for: patterns of sound, patterns of meaningful items (i.e. morphemes), and patterns of function, in terms of what Pike calls 'tagmemes' (the minimum unit of grammatical patterning). In accordance with the kinds of patterns language is said to be trimodally structured, at three different levels. Each level has its own inventory of minimum units which show patterns of distribution. And the patterns of each level are described in terms of the other levels, unlike Post-Bloomfieldian theory which posited the abstract level of phonemics to maintain a hierarchy and a unidirectional sequence of operations. The Post-Bloomfieldian theory was essentially a two level theory comprising the grammatical and phonemic levels and both levels were ultimately interpreted in terms of the phonetic data. In tagmemics however, the three levels are independent to the extent that all three may be directly interpreted as associated with some portion of meaning data. Otherwise it resembles

Post-Bloomfieldian theory in that the formal variants of each level are stated within the terms of the next level in the hierarchy, only the phonological variants finding an interpretation in phonetic data.



(Davis 1973:177)

Given this brief introduction to the theory, we will now point out the various features which render it explanatory in nature. Once again, we see that in order to discover patterns within the verbal portion of the behavioural hierarchy we must first establish some way of discovering "sameness" or identity of the different units of the theory — tagmemes, morphemes and phonemes. The manner in which a theory deals with identity determines whether it is operational or explanatory (Davis 1973), and as we have seen earlier in the case of Post-Bloomfieldian theory, a theory which does not assume identity but attempts to define it, is operational.

In tagmemic theory, unlike an operational theory, the terms tagmeme, morpheme etc. are assumed to be emic

units, i.e. there is a relationship of non-identity between them. But the morphemes, phonemes etc. can be said to be 'emic' units only after some identity is established between the several 'etic' variants of each.<sup>4</sup> To establish such identities initially some educated guesses must be made. These are then evaluated by criteria chosen from within the system - criteria of exhaustiveness and simplicity of accounting. But the ultimate criterion of determining 'emicness' is native speaker's intuition - "units are different emically when they elicit different responses from people acting within the system" (Pike 1967:38). But these emic units, like the allomorphs and morphs of Post-Bloomfieldians are abstract units posited for convenience of description. They do not have any direct manifestation in data and if they "are to be presented structurally, they must be supplemented by etic, physical description" (1967:38).

Once different units have been assigned to their levels the question of establishing distinctiveness between the units of the same level arises. For this, there are various requirements, e.g. syntagmemes, to be distinct, must differ in two of their tagmemic constituents, one of which must be nuclear, or obligatory, within the syntagmeme (Longacre 1960:75).

The assumption of identity and reliance on intuition is clearly the hallmark of an explanatory theory. As Pike comments - "We have insisted for a decade that

intuitive components must enter (the analysis). It is the necessity of these intuitive components in analysis which makes a mechanical discovery procedure impossible" (1967: 225 fn.).

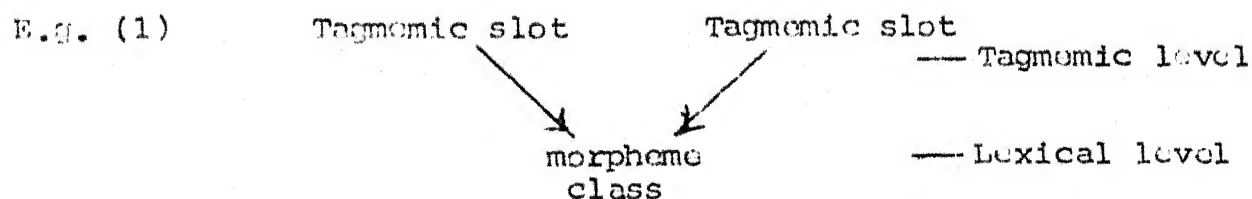
Secondly, in tagmemics, theory and procedure are separate. Here, it is the theory that determines the procedures, whereas in Post-Bloomfieldian theory it was the possibility of implementing certain operations successfully that dictated the type of theory. To a great extent, in fact, the procedures defined the theory. It is not so in tagmemics where the procedures are based on the linguistic theory (Pike 1967:224), thus rendering the theory non-operational in nature.

Further, in Post-Bloomfieldian theory, definitions were ordered according to the set sequence of operations. In tagmemics however, the levels are not necessarily ordered, for the definition of phoneme need not precede that of the morpheme. The units of each level are conditioned relative to the units of a second or third level and thus presuppose operations within another level. "... there is no 'starting' set of units at the 'lowest' level of analysis" (Pike 1967:271).

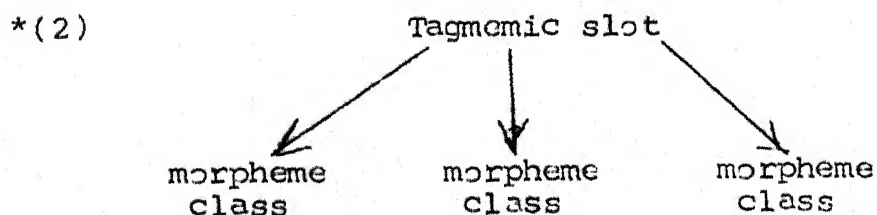
Tagmemic procedures then, do not resemble the operations of Post-Bloomfieldian theory. They are merely semi-formalized techniques for handling data, dictated by the assumptions and requirements of the theory. We thus conclude that tagmemics is an explanatory theory.

### 2.3.2.1. Implications for the Lexicon:

In the earlier theories we discovered that there were only two levels of patterning, the grammatical and phonological, and the lexicon or morpheme inventory was part of the grammar. Tagmemic theory being trimodally structured, the lexical level is the middle level. The theory adequately demonstrates within its framework the non-isomorphy between the grammatical and lexical patterning, and consequently assigns to the latter a distinct status. The lexicon is not part of the grammar, but its elements are correlated with grammatical positions i.e. tagmemic slots. Each morpheme (class) can be correlated with more than one tagmemic slot (e.g. subject-as-actor or goal-as-predicate), but one tagmemic slot, by definition, can be correlated with only one morpheme class. It was because of this difference in patterning that the two levels were recognized as distinct.



(1) is possible but not (2):

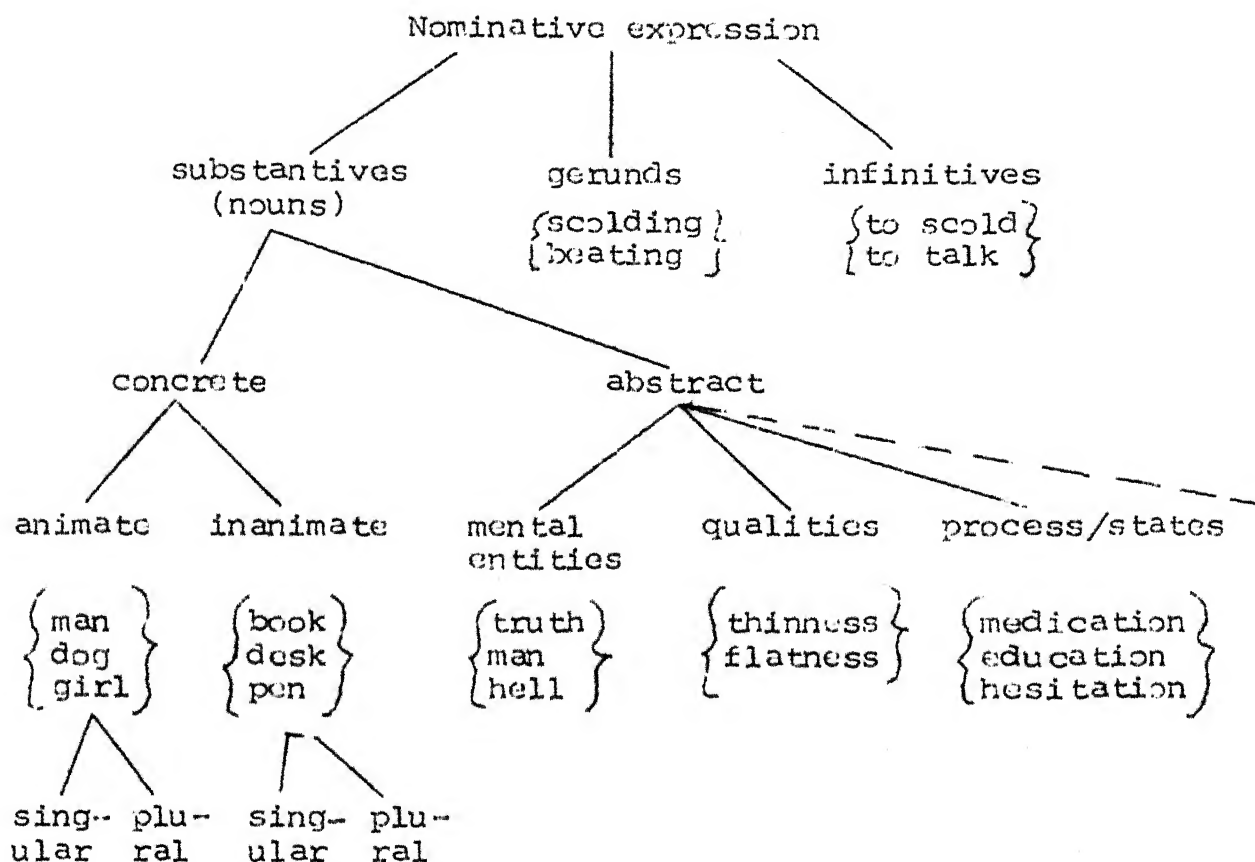


The morpheme is the minimum unit of the lexical level and is defined as a composite of meaning with form (Pike 1967:163). The form is the sound patterning property of language described by the phonological level. The grammatical function of the morpheme is described by the tagmemic level. Variants of morphemes such as s / z / iz of plural morpheme occur as different forms in the phonological level, although they have the same meaning. Morphemes can also have variants in terms of meaning. But whereas the variants of form can be conditioned by any of the three environments - morphemic, phonemic or tagmemic - the meaning variations are conditioned by the tagmemic environment alone. That is, its linguistic meaning is considered to be synonymous with its grammatical function.

Morphemes also have patterns of occurrence relative to one another. These are expressed by means of disjunctive classes (as in Post-Bloomfieldian theory) and it is these distribution patterns that characterize the lexical level - although they are also correlated with the grammatical mode. These disjunctive classes are described by matrices instead of constructions, but the pattern attributed to the distribution of morphemes is exactly analogous to the pattern attributed to grammar by Harris and Wells i.e. large inclusive hyper-morpheme or focus classes include disjunctively related classes of morphemes which according to their internal structure, fall into subclasses.

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Example :



Thus we see that the lexical level is equivalent to the morphological description of Post-Bloomfieldian theory and the unit of description is again morpheme classes instead of individual morphemes. The class meaning of these (hyper) morpheme classes is the tagmemic slot with which they are correlated. Whereas Bloomfield listed the morpheme and its form-class together with its phonological shape in the lexicon, the later theories separate this information, and several parallels can be drawn between their manners of description although one theory is operational in nature and the other explanatory.

In the tagmemic lexicon however, the lexical information is distributed over three levels. The lexicon is then a network of relationships, patterned in three different modes. It is not a single distinct component related to the grammar by means of some procedure but is in fact, inseparable from the description of the language. And because it is a network, there are no processes in it (or in the theory for that matter) analogous to the processes of Bloomfieldian theory. We shall have more to say about processes and their significance in linguistic theory in the following section.

### 2.3.3. Hockett's Status in Descriptive Linguistics: The IA and IP Grammatical Models:

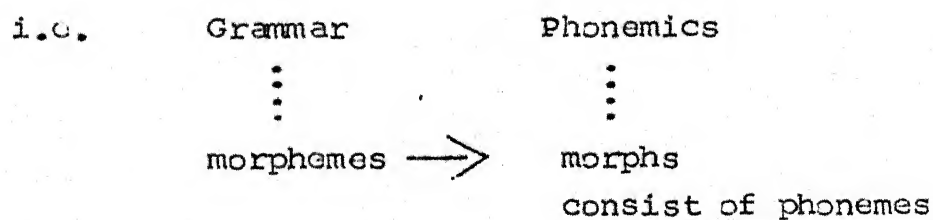
We have examined the development of two different strands from the original Bloomfieldian theory, viz. the operational and the explanatory. And the dimension we chose for determining their nature was the manner in which they dealt with the issue of identity/non-identity. We then related this to our main thesis by pointing out the effects of the different kinds of description on the structure of the lexicon. It is our contention here that Hockett's theoretical position falls midway between these two extremes and, in places, he closely follows Bloomfield. But to establish this we have to introduce the distinction between the Item-and-Arrangement (IA) and the Item-and-Process (IP) models of grammatical description (Hockett 1954).



Bloomfield in Language (1933:161) maintained that a morpheme consists of phonemes. Yet at another place in the same chapter he claimed that a morpheme can have alternants which are, by definition, phonemically different (cf. 2.1.2). Nowhere has he reconciled the two statements. The Post-Bloomfieldians however saw the morpheme as a class of phonemic sequences - its allomorphs (Nida 1948) or morphemic alternants (Harris 1942). But there is a difference in the way the relationship between the phoneme and the morpheme is treated, and this difference constitutes the essence of the distinction between the IA and IP models.

The relationship of grammar to phonemics involves relating a unity to a variety, and this relationship is termed morphophonemics (Hockett 1942, 1958:271-6).

The Post-Bloomfieldians (Harris, Bloch, Wells) do not recognize the morphophoneme as the minimum unit of grammar, as does Hockett. Theirs is a taxonomic theory that permits only a relation of made-up-of within a taxonomy, and demands total accountability, in that every morph in an utterance belongs to only one morpheme (the morpheme may be represented by more than one morph, but only one morph figures in any one utterance).



Hockett (1947) however proposes an analysis in which there may be more morphs in an utterance than morphemes, because he posits two additional kinds of morphs - empty morph and portmanteau morph, which belongs simultaneously to two morphemes. The empty morph is not made up of phonemic material.

The Post-Bloomfieldians deal with alternants in accordance with their taxonomic operational bias. They classify a unit on the basis of distribution and then make their statements about the system in terms of the arrangement of these units.

As Harris (1942)<sup>5</sup> puts it: "It is not enough to show that all such relations between alternants are special cases of one relation, namely that between the alternants of one morpheme unit. For there are differences between these cases, and we must see if it is possible to arrange these differences systematically as subdivisions of the operation of grouping alternants into units. It appears that we can record these differences in a simple manner if each time we group alternants into one unit, we answer four questions: (1) What is the difference between the alternants of this unit? (2) In what environment does each alternant occur? (3) What similarity is there, if any, between the alternant and the environment? (4) What morpheme units have this difference between their alternants? "

Also Bloch (1947) in his paper on Verb Inflection claims that by analysing every inflected form as a combination of morphemes in a particular order and by avoiding all reference to the process by which the form is derived, we shall be able to systematize the facts of English verb inflection in a way that will be more useful to the descriptive linguist. That is, in citing a verbal base, in the lexicon or elsewhere, we must give all its morpheme alternants. And Bloch gives a list of irregular verbs as they might appear in the lexicon (1947:249).

e.g. 'be' → / biy, i, wʌz, wəhr, bi, ah, wəh /.

According to Bloch (1947:251) morpho-phonemics is the study of the alternation between corresponding phonemes in alternant shapes of the same morpheme. When the morpheme alternants of a language, or of some form-class in a language, have been listed in full, the statement of the morphophonemics will serve as a convenient index for the listing.

It is this kind of description that Hockett terms Item-and-Arrangement. It is present implicitly but not with complete clarity, in Bloomfield's chapters on grammar, for wherever there are traces of "process" in his descriptions, Bloomfield is sometimes a bit apologetic. The proponents of IA are Harris and his students, Bloch, Wells and later Nida. There are however very few full grammatical descriptions which illustrate IA in its purest form.

Hockett also points out that there are some morpho-phonemic problems which find no solution in IA (1947, 1954) because either a multiplicity of solutions present themselves, or because the intuitively best solution is in violation of the fundamental orientation of IA (cf. Hockett's (1954) discussion of 'took').

Hockett's treatment of morphophonemics is in terms of "process". For example, according to him the convenient solution for "took" is to replace / ey / → / u /, but replacements are not made up of phonemic material and any redefinition of morph to suit such a solution, as in the case of zero morphs, would involve a basic change in the IA model, which would then become IP. Hockett's approach assumes two levels, the minimum unit of phonemics being the phoneme and of grammar the morphophoneme (a class of phonemes, but not itself a phoneme). Bloomfield's morphophonemic statements were made in terms of add, delete and replace i.e. / d / "becomes" / t / finally and / d / before vowels. Hockett uses the relation of "represented by" (Hockett 1961): that is / d / is represented either by / t / or / d / in the above positions. But represented by is as non-taxonomic in nature as add, delete and replace, all of them being terms in an IP grammar. In the IP model a derived form consists of one or more underlying forms to which a process has been applied. In fact, some of the phonemic material in a derived form may not be part of an underlying form, but

may be a representation or marker of the process, and in this case, the conditions under which the process applies will have to be stated, e.g. man  $\rightarrow$  men and take  $\rightarrow$  took contain different markers of the same process of replacement.

In morphophonemics then, IP provides intuitively better solutions than IA. IP is an older model than IA, its first proponents being Sapir and early Nida. Hockett's version is however, at least superficially different from that of Sapir, especially his use of the term 'process'. For whereas Sapir considered vowel change and suffixation to be different processes, Hockett considers them different markers of the same process. e.g. he considers 'took' and 'baked' to have been derived by the same process of past-tense formation.

The IA model is a necessary consequence of a purely operational bias. The fact that Hockett did not subscribe to it but chose to modify the older IP model for his description sets him apart from the Post-Bloomfieldians discussed in 2.3.1. However this is not to imply that Hockett's theory is explanatory in nature. He incorporated many of the results of IA in his approach and his model is possible within the operational framework, though the resultant theory will have a very much weaker operational bias.

Hockett (1954) set forth several criteria for the evaluation of a grammar which were later echoed by Chomsky,

the most significant being that a model should be applicable to any language, not just languages of certain types; it should be productive and have built-in criteria to select one solution over another. So far, neither IA nor IP meets these criteria, and according to the above discussion, neither has a fully articulated description of the grammar of any language. But IP with its processes and its criterion of the intuitively best solution can be regarded as the ancestor of transformational generative grammar (TG). TG, however, is a highly sophisticated form of IP, and apart from these features has very little else in common with the original, it being an explanatory theory based on the view of language-as-knowledge instead of language-as-behaviour.

#### 2.4. Conclusion:

In this chapter we have examined Bloomfieldian theory and Post-Bloomfieldian theories along two parameters - the operational-explanatory and the IA-IP. Bloomfield's Language showed him to be primarily an operationalist who tried to adhere to the IA model of description as far as he could. But Bloomfield's insights into language made him aware of the limitations of such an approach and, albeit unwillingly, he made limited use of processes - in the tradition of Sapir. His model is thus not purely operational since it displays some obvious characteristics of an explanatory theory as well.

However, all these trends, which were so merrily mixed up in Bloomfield, were developed separately and rigorously by his followers. One section opted for a strongly taxonomic operational theory and made its statements of description in terms of item and arrangement, and another (Pike and the tagmemic school) opted for an openly explanatory theory. Hockett comes somewhere in between since he favours a weaker version of operationalism, non-taxonomic in nature, and makes use of processes in his description of morphophonemics.

Our purpose in making this kind of a study was to show how the orientation of a particular theory affects the structure of the lexicon. The lexicon of a language is a "network" in which each item is related to other lexical items in a variety of ways. In the above study we have shown how different approaches highlight different aspects of this network. The lexicon is considered by all to be a part of grammar, its role being to facilitate the statement of a grammatical description.

For Bloomfield the minimum unit of grammar was the morpheme, so it was the morphemes that were listed in the lexicon, along with form classes. For Post-Bloomfieldians it was morpheme classes that formed the basis of description, hence these were the elements of the lexicon, along with member morphemes. All the different viewpoints, however, submitted to the criteria of simplicity and economy of

description and this is reflected in the structuring of their lexicon, since by giving priority to one type of element over another, they were aiming ultimately for the overall simplicity of the grammar. But, as Hockett pointed out, the IA model involved a lot of repetition of morphemes in the lexicon. In fact, the criterion of economy, so obviously in play where form-classes and constructions were concerned, seemed never to be evoked with regard to number of morphemes.

Possibly the belief was that since there are a great number of morphemes in any case, some more would hardly matter. The IP model could perhaps overcome some unnecessary listing, as in the case of the irregular variants of 'took' and 'be', provided it posited "process-types" instead of a different process for the derivation of each variant, and entered these types in the lexicon as well. In Chapter IV we will see how the IP model in a highly modified and sophisticated form is used within the framework of a non-taxonomic explanatory theory, to account not only for morphophonemics but also for syntax.

Another limitation of the descriptivist lexicon we would like to point out follows as a consequence of one of the basic assumptions of the school. It is in the lexicon that the relation between meaning and form should be established. The descriptivists spent their energy in establishing form without the aid of meaning, and this is reflected in the incomplete nature of their lexicon. It gives only



the phonemic and morphological structure of an item and equates its meaning with its grammatical function. There are no semantic features to account for the meaning of a word and its selection restrictions. A word being the meeting place of meaning and form, a very one-sided picture of the word emerges from such handling.

## CHAPTER III

## ANTHROPOLOGICAL LINGUISTICS

## 3.0. Introduction:

In this chapter we will trace how semantics came to be formally accepted as an indispensable part of linguistic description. As we have seen in Chapter II the Post-Bloomfieldian emphasis on operationalism required the total exclusion of all meaning from a descriptive analysis of language. And as we also noticed in the earlier chapter, this constraint led descriptivists into a lot of trouble, not the least of which was that it made their account of language cumbersome, uneconomical and incomplete.

It has been widely recognized and accepted for many years now that if a description of language is to be at all efficient, semantics must necessarily form an important part of it. This belief however was nothing new in the history of linguistics. American Descriptive Linguistics, comprising mainly Post-Bloomfieldians, was just an interlude in an otherwise continuous tradition which gave meaning its due place in the study of language. So much so that at one time the study of meaning was considered to be the main aim of linguistics (or philology, as it was then called).

This was especially so at the beginning of this century, and evidence is to be found in abundance in the works of B. Malinowski and J.R. Firth in England, and Sapir

and Boas in America. We shall therefore begin this chapter by examining the tradition of Anthropological Linguistics as it was practised then on either side of the Atlantic; and trace its influence on linguistics as it is practised today, with special emphasis on the consequences of its theoretical assumptions for the lexicon.

### 3.1. American Anthropological Linguistics:

Franz Boas can justifiably be considered the instigator of anthropological linguistics for it was he who introduced the field approach in the study of native languages. He maintained that the semantic glosses provided by the natives themselves to their vocabulary should form the material for study. And although this may seem obvious in the present times, at that stage in the development of the discipline, it was something new and revolutionary. He established the tradition that the patterns of sounds, forms and meanings are to be studied and described within the context of actual native usage. No preconceived standards were to be imposed since he pointed out that each language may be arbitrary in its classification from the point of view of another. Each language tends to lexicalize only those meanings and concepts that have significance for native speakers, or that have some direct bearing on their way of life etc.

Boas' tradition was ably carried forward by Sapir in America itself and, as we shall presently see, the same conclusions were reached by Malinowski in England. These

anthropologists were interested in language solely because it provided a means to a clearer understanding of ethnological phenomena, and their valuable insights into the nature and structure of language were only a consequence of their primary aim of understanding different cultures. In fact, their contributions to linguistics can almost be said to have been made in the nature of afterthoughts.

One important facet of language that was emphasised by Sapir, and which distinctly echoes Boas' views, was the reflection of the interests of a culture in the vocabulary of its language. (In fact, this and many other points first made and documented by Sapir have now become a part of the common parlance of linguistics). This has far-ranging implications, an important one being that language is rarely a purely referential organisation, i.e. a one-to-one correspondence between a word and what it signifies is not often found, except in scientific jargons. This is because there is a close interplay between language and experience since language is usually learned in constant association with actual contexts (Sapir 1933).<sup>1</sup> This implies that a purely formal study of the patterns and structures of language is not sufficient to understand language, or to get an overall comprehensive picture of the communication code of a particular community. Each language, whether primitive or modern, can lay claim to formal completeness and a study of its grammar is essential in as much as it shows how it structures its linguistic content into communicable meaningful material.

But it is this content, the vocabulary of the language, and how it is itself structured according to the needs of the community that interests us here. And Sapir, as far back as 1933, had an important observation to make which is recognized even today: "The fact that almost any word or phrase can be made to take on an infinite variety of meanings seems to indicate that in all language behaviour there are intertwined, in enormously complex patterns, isolable patterns of two distinct orders. These may be roughly defined as patterns of reference and patterns of expression."<sup>2</sup> Later Katz and Fodor came to a similar conclusion when they made their distinction between meaning and connotation.

Anthropologists did not submit to the linguistic trend of rigorously avoiding all reference to meaning in their study of language, and since they were mainly interested in the vocabulary of a language, which was a reflection of culture, it was inevitable that meaning, context and experience should figure prominently in their discourses on the subject.

Sapir points out that it is not possible to understand language as form alone, since language has a largely functional and symbolic nature. The content elements, the words, have far more to them than just their grammatical form. As he says in "Language and Environment" (1912) there is an obvious difference between "words that are merely words, incapable of further analysis, and such words that are so evidently secondary in formation as to yield analysis to even superficial reflection,"<sup>3</sup> i.e., he laid the foundation

on which later linguists and anthropologists built, in this case the notion that words are analysable entities, that they package two or more elementary concepts or semantic units. And the combination of these units follows patterns that seem to be shared by different languages to some extent.

Sapir (1933): "A type of influence which is neither exactly one of vocabulary nor of linguistic form, in the ordinary sense of the word ... is that of meaning pattern. It is a remarkable fact of modern European culture, for instance, that while the actual terms used for certain ideas may vary enormously from language to language, the range of significance of these equivalent terms tends to be very similar, so that to a large extent the vocabulary of one language tends to be a psychological and cultural translation of the vocabulary of another."<sup>4</sup> It is this property of languages that makes translations possible. As an example he cites the interesting parallelism in nomenclature between some kinship terms of English, French and German. The terms 'mother-in-law', 'belle-mere' and 'Schwiegermutter' may not be equivalent in literal meaning but they are patterned in the same manner and refer to a common relationship. Thus 'mother-in-law' and 'father-in-law' are paralleled by 'belle-mere' and 'beau-pere' in French and 'Schwiegermutter' and 'Schwiegerwater' in German. We shall have more to say about kinship terms and the significance of their study for linguistics later in this chapter. What Sapir probably wished to point out here, apart from the linguistic parallelism of the terms,

was that the same relationship, the same semantic concept, was culturally significant in all three speech communities, since the respective languages felt the need to lexicalise it.

Sapir's notion of patterning in language was not defined solely by means of the distributional classification of elements but also on the way different elements are used in the language i.e. use, meaning, function played an important role in establishing and describing patterns. For example, in his study of grading terms (1944) he points out that many grading terms like good, near "color the judgement with their latent effect of approval or disapproval."<sup>5</sup>

In this manner, from his analysis of the total meanings which are expressed in each word, Sapir isolates various factors of meaning - a technique which proved valuable in later years as a method of semantic analysis.

Before we pass on to discuss the British tradition we should like to briefly mention another observation of Sapir's that has important implications for what has come to be known as the open-ended nature of the lexicon, and the possibilities it holds out to extend itself by building upon material already available within it.

Earlier we pointed out that an essential characteristic of any language is its formal completeness i.e. the rules, the patterns, the forms it requires to generate its sentence structures are all there. Hence the adequacy of a language does not depend on its formal structure but on its ability to add to its content as and when the need arises,

on its power to create items based on its static formal machinery.

Sapir (1933): "New cultural experiences frequently make it necessary to enlarge the resources of a language, but such enlargement is never an arbitrary addition to the materials and forms already present; it is merely a further application of principles already in use, and in many cases little more than a metaphorical extension of old terms and meanings."<sup>6</sup>

We see then, that though Bloomfield was a follower of Sapir's and adopted and developed many of the latter's insights about language, there is still an essential difference in their theoretical orientations. Sapir incorporated semantics into his work and was an ardent advocate of the process model; that is, he saw linguistic elements and the relations between them as being the result of processes in language. Yet Bloomfield's work, though it represents a later stage in this line of development, makes only a limited use of process - in the field of morphology - but otherwise presents a picture of linguistics as a classificatory and distributional science. But to be fair to Bloomfield, he did give some importance to the use of meaning in the study of language; although his followers, the proponents of the Descriptive School, attempted to exclude meaning altogether from their work (cf. 2.3.1).



### 3.2. The British Tradition:

Malinowski was one of the few anthropologists of his time, and certainly the only one in Great Britain, to have an abiding interest in language itself. Also, his views and assumptions about language and his 'context of situation' theory of meaning, had an important influence on the formulation of Firth's linguistic position.

The theories of Malinowski and Firth, the 'London School of Linguistics' as it has been dubbed by Langendoen, can be shown to have historical and theoretical connections with the theories of American linguists. Further, the study of kinship systems by anthropologists can be shown to have had important theoretical implications for the development of the methods of linguistic analysis, especially Malinowski's belief in the existence of universal abstract entities in anthropological theory which were generally expressed as rules for social conduct, but whose actual manifestations could take different forms in different societies. For when the anthropologist works in this way he is working more or less parallel to the linguist. They are both trying to build a structure with constituent units. We shall take up these issues separately.

#### 3.2.1. Malinowski:

Malinowski's only published linguistic description was his paper, 'Classificatory Particles in the Language of Kiriwina' (1920). And throughout the paper Malinowski asserted

the need for the development of a theory of semantics. He argued that without a semantic theory of language a satisfactory grammatical analysis is not possible. Formal criteria are not enough to provide a basis for grammatical analysis or even for classifying words.

Speaking of classifying Kiriwinian words into parts of speech he said "... in dealing with the grammatical character of the various formatives we had to keep their meaning constantly before us" (Malinowski 1920:78).

The goals that Malinowski set for a semantic theory were, first, that it should provide a basis for the definition of grammatical categories and secondly, that it should have the ability to account for the particular grammatical facts of a language in terms of the semantic context in which the language was spoken. "When defining the meaning and function of several of the formatives we had to make excursions into ethnography, describe customs and state social conditions." (Malinowski 1920:78)

Malinowski later revised his views to some extent, but the emphasis on meaning and context remained. But since our main purpose here is not to review the works of Malinowski but to present his thoughts and theory of language with a view to tracing its influence on later developments in linguistic theory, we shall now present his later and modified views on language as set forth in "The Problem of Meaning in Primitive Languages" (1923). Most of Malinowski's other work is of great importance to ethnographic theory

but does not have much of value to say about language.

Here, according to Malinowski, language in its primary function is "to be regarded as a mode of action, rather than as a countersign of thought." (1923:297). Further, "... it should be clear at once that conception of meaning as contained in an utterance is false and futile ... utterances and situation are bound up inextricably with each other and the context of situation is indispensable for the understanding of words. Exactly as in the reality of spoken or written languages, a word without linguistic context is a mere figment and stands for nothing by itself, so in the reality of a spoken living tongue the utterance has no meaning except in the context of situation" (1923:307). Thus, an utterance does not receive its meaning from the concatenation of the meanings expressed by the words comprising it but from its relation to the situational context in which it occurs. However, we must be careful to remember that Malinowski was not at all concerned to account for how native speakers themselves understood their language, but how an outsider could translate and understand the language.<sup>7</sup> We are not very much concerned with this question ourselves, but what we wish to emphasize is that he gave a great deal of importance to meaning, and the insights he had to offer about language had some influence on the work of linguists who came after him.

Malinowski's work was full of contradictions and inconsistencies however, and we find that a number of times his theoretical assertions do not match his practical analysis.

In a semantic analysis of a Trobriand sentence he showed that it is possible for a native speaker to learn the meanings of sentences in his language independently of their context of occurrence and he also showed how the meaning of the sentence could be arrived at in terms of the meaning of lexical items. We noticed that at one point he denied the assumption that the meaning of a lexical item is "contained" in it, yet in the analysis of this sentence he explicitly referred to the meaning of lexical items. But the inconsistencies do not obscure the true insights he had concerning the meanings of words and utterances.

For instance, he said that the meaning of words is not given by the physical properties of their referents, but by their function.<sup>8</sup> But he pushed this insight to the extreme and this led to undesirable consequences: "A word means to a native speaker the proper use of the thing for which it stands .... A word is used when it can produce an action and not to describe one, still less to translate thoughts" (1923: 322).

He insisted that all words and utterances are functionally defined, and that meanings are learned only by active experience and never by explanation or paraphrase (Langendoen 1968:22). Possibly it was this that led to his context-of-situation theory - and we shall show what impossible consequences this theory led to when we discuss Firth.

But underlying this extreme stand is the relevant observation that for a speaker to be able to formulate certain

concepts in his mind, and to be able to express them in words, he requires certain appropriate experience of the word. This has however been undermined by his insistence that the relationship between the physical experience and the derived concept was a direct, one-to-one relationship i.e. he took an essentially behaviourist view of language acquisition.

### 3.2.2. Firth:

Firth adopted Malinowski's notion of 'context of situation' but in a form so modified that it shares very little with the original concept. Malinowski's other, more valuable insights seem to have been bypassed by linguists and anthropologists alike.

Firth's main interest, however, was different from Malinowski's. Whereas the latter was an ethnographer forced into linguistics by the needs of his own subject, Firth was a linguist, deeply concerned with linguistic theory, and was forced into ethnography in order to achieve an adequate understanding of language (R. Robins 1971). It is worth noting here that both shared an interest in meaning since they believed it essential for an adequate study of language.

Firth's context of situation was a more abstract affair than Malinowski's 'environmental reality', and he maintained that all the factors which were involved in the understanding of an utterance and its components could be identified in situations and classified accordingly. But it is well known that he provided inadequate exemplification of

According to Firth (1935),<sup>9</sup> "the complete meaning of a word is always contextual, and no study of meaning apart from a complete context can be taken seriously".

But context for him was a complicated affair, comprising several different levels. He split up meaning or function into a series of component 'functions', each being defined as the use of some language form or element in relation to some context, i.e., meaning is to be regarded as a complex of contextual relations, and phonetics, grammar, lexicography and semantics each handles its own components of the complex in its appropriate context. Hence he has what is called a 'phonological meaning' which is accounted for by the 'phonological' context and so on. Firth further claimed that each utterance has its unique context of occurrence, and this led to the **absurd** position that "the use of the word 'meaning' is subject to the general rule that each word when used into a new context is a new word" (Firth 1951).<sup>10</sup> However in his actual linguistic analysis Firth made use of the identifiability of words apart from the contexts of occurrence - and this disparity between theory and practice, especially where meaning is concerned, can be traced at almost every stage in the development of linguistics.

The theory is further rendered meaningless by the fact that Firth never showed how context could be analysed formally, in a way that would be relevant to semantics; and since utterances are normally meaningful apart from context, it should be possible to show that in a majority of cases,

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context has nothing at all to do with the semantic interpretation of sentences uttered in it.

There is another major discrepancy in the work of both Malinowski and Firth. Both observed that given some utterance or word, it was generally possible to state contexts in which they could appear (Firth 1935<sup>11</sup> and Malinowski 1923). This ability of language users to provide contexts to words and utterances ad lib, based on their prior knowledge of the meanings involved, runs totally counter to their assertion that contexts are required to provide semantic interpretations. But it tells us something important about words and utterances: that it is possible to give them a semantic characterisation without resorting to extra-linguistic domains.

Although Firth's context-of-situation theory does not hold much water, his idea of 'meaning by collocation' is noteworthy. This claims that the meaning of an utterance is partially determined by the cooccurrence potentialities of words which occur in it. This concept represents Firth's attempt to formalize his thesis that the meaning of words lies in their use (and by 'use' Firth means occurrence in linguistic context).

Roughly speaking, the notion means that if a word appears typically in the environment of other words, then that word takes on as part of its meaning its ability to occur in such environments. Some faults can be found with this explanation, a main one being that this theory cannot take advantage of the regularities in language e.g. in the



collocation 'dark night', each word takes on as part of its meaning its ability to occur with the other, and this information will have to be repeated while characterizing either word in this particular combination. Possibly new information will have to be added to 'dark' in, say, 'dark complexion' or 'dark mood'. The basic principle underlying this theory is sound, but the machinery for describing it is inelegant. Later theories rectified this fault by positing the notions of selection restrictions, complex symbols, projection rules etc. (cf. Chapters 4 and 5). Nor did they maintain that each word in a new context is a new word - a tenet calculated to create chaos in the organization of a lexicon.

However the idea and the attempt to explain it are worthy of note, as is his central position that "the main concern of descriptive linguistics is to make statements of meaning" (Papers 1957:190).

Both Malinowski and Firth in their explications of the notion 'context of situation' have have left much to be desired but what must not be lost sight of is that they were both attempting to face the problem of lexical meaning and its basis in the native speaker's intuitive knowledge of his language.

It is true that it is a besetting sin on the part of semantic theorists that they choose their illustrations from that part of the lexicon that easily fits their theory, e.g. certain kinship terms that are easily characterized -

and then assume that the rest will follow. But a beginning has to be made somewhere - and the indisputable fact remains that our knowledge of the meanings of words is not a priori but is acquired by means of some sort of abstraction process from utterances heard in specific situations.

Context-of-situation was an attempt to suggest what lies behind our knowledge of word meanings, and the failings of the model were mostly due to the confusion between the two notions - language meaning and language use.

But even after making concessions for the pioneering effort, the fact remained that Firth's theory fell short on precision and empirical adequacy not only on grounds of his 'context of situation', but also on his definition of the term 'significance' which he takes to mean acceptability at the highest level of analysis - in an actual context. That is, an utterance may be grammatical but if it is to be 'significant', meaningful, it must have what he calls 'implication of utterance'. It is for this reason, because he cannot envisage such sentences as Sapir's "The farmer kills the duckling" ever being employed in some actual context of use that he describes them as "nonsense"<sup>12</sup> (Lyons 1966:291).

Hence, although Firth recognized the fact that situational correlations are an integral part of the description of language, his insight lost its usefulness because of his rash claim that all utterances can be profitably "referred to typical participants in some generalized context of situation" (Firth 1957:226).

Further, as Lyons (1966) argues, Firth's theory of semantics is incomplete because it has no provision for handling the relation of reference. And it is generally accepted by semanticists that this relation which holds between expressions of a language and entities outside the language, is an integral part of a semantic theory, as are other meaning-relations like synonymy, antonymy etc. which are alike bypassed by Firth's theory.

Hence, Firth "does not provide us with a complete theory of semantics, but rather with a theory of linguistic structure in which the term 'meaning' is given several different and peculiar interpretations" (Lyons 1966:300).

Yet, in spite of the model not being sufficiently delimited to make any meaningful study within it possible, and inspite of its zany treatment of meaning, it had the much needed effect of making linguists aware of the necessity for a careful study of the relationships involved in 'meaning'.<sup>13</sup> And however undeveloped its application was, it made the attempt to come to grips with the very basis of meaning relations - something which linguists had thus far been content to take for granted.

The semantic theories of these anthropologists and their attempts to account for how words acquired meaning show a distinct bent towards an explanatory theory of language. That is, unlike Bloomfield and the Post-Bloomfieldians, they were not content to just describe and classify the observable structure of language in terms of distributional statements -

but also to account for how these structures came into being, and how the interrelationships of different units of language contributed to their meaning. Such an approach had a significant if indirect effect on the study of lexical items and the characterisation of the structure of the lexicon of a language. It also showed up how one-sided and inadequate an analysis was when meaning was left out of reckoning as something irrelevant and extraneous to linguistic science.

Although the methods and theories of the anthropologists we have discussed were faulty and inconsistent at times, yet we find some clue in their work to the method of semantic analysis developed by Lounsbury (1956) and Goodenough (1956); a method that later, with some modifications, came to be widely accepted. We refer here to the many analyses of kinship systems attempted by anthropological linguists.

### 3.3. The Relevance of Kinship Studies:

The phenomenon of kinship plays an important role in the study of any culture, hence it seems reasonable that it should have been singled out for detailed study. And the growth of the technique of componential analysis has its roots in such studies. The technique as such was not new in linguistic science, having been successfully applied to phonemic analysis by the Post-Bloomfieldians. But its application to the material of semantics had not been attempted earlier. In fact, the endless kinship debates of anthropologists were one reason why linguists did not take

them up on it seriously (Ardener 1971), just as the endless phoneme debates of the Post-Bloomfieldians were responsible for the alienation of anthropologists from linguistics.

However the basic premise that both students of culture and of language implicitly posit as a starting point is the fact that language is easily the most autonomous, self-contained and consistent unit which is discernible within the totality of culture. Secondly, there is one body of phenomenon which they both indubitably share, that is, meaning. Here, we want to show the connection between the techniques for the analysis of meaning in linguistic anthropology, and the techniques for semantic analysis in linguistics proper. We feel it will be possible for us to do so since the field of semantics happens to be of common interest to both.

Anthropologists, however, were more concerned with achieving a greater understanding of the behaviour of the people of a particular linguistic community and the study of kinship was a fruitful means of achieving this goal. The anthropologist uses semantic analysis of a society's kinship terminology only as a tool for getting at the structure of the non-linguistic behaviour within the family and kindred in their society i.e. the system of discriminatory linguistic behaviour is then related to the system of discriminatory non-linguistic behaviour (Lounsbury 1956). But the way they set about their analysis resembled the technique of componential analysis - as applied earlier to phonemic data.

Let us now briefly examine the various means employed in studying the kinship phenomenon.

Malinowski's treatment of kinship was not very satisfactory for he disliked the systematic statement of theory; hence all his accounts of kinship are highly descriptive and rambling in nature and are riddled with psychological explanations. Secondly, he very inadequately stressed the fact that kinship relations have to be seen as a system, within the framework of the total social structure. His main focus of study was the 'individual family', and he gave a descriptive presentation and explanation of kinship custom and behaviour — but his was not an analytical theory, for he failed to understand the classificatory nature of kinship terminologies, that kinship terms designate jural relationships and groupings, not just certain emotional associations.

But what Malinowski revealed even through this inadequate study was that "the deepest layers of conduct, feeling and social relationship are manifested in custom and are therefore accessible to scientific inquiry" (Meyer Fortes 1957).

By pointing out the shortcomings of Malinowski's kinship studies, we have indirectly laid down some kind of criteria for an adequate study of kinship terminology. Later studies in the field have profited from Malinowski's faults and have treated kinship as an ordered system within an overall social structure, one capable of being subjected to analytical study.

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Firth (1951) makes the observation, "In the analysis of vocabulary elements it is important to group together those which form a series. Such series for example might be kinship terms, parts of the body, terms of orientation in time and space .... in short all lexical items which exhibit structure .... The attempt should be made to construct complete series of those terms, as well as those which, according to linguistic or other criteria, form a system."

That is, first and foremost, it is important to realize the fact that kinship terms form a separate system in the lexicon of a language, and the structure of a system can always be subjected to analytical study provided one has the appropriate techniques at one's disposal. Secondly, we wish to point out that our purpose in examining kinship literature is not to trace the history of kinship studies, nor are we concerned with defining a theory of semantics. We just wish to show how the attempts to arrive at definitional meanings of kinship terms led to the development of the technique of componential analysis. It is just that, as Goodenough stated (1956), "The problem of determining what a linguistic form signifies is very well illustrated by kinship terms."

Malinowski himself may well be surprised if we attributed the rudimentary beginnings of the technique of componential analysis (henceforth CA) to his studies on Trobriand kinship. He gave genealogically based definitions to the native kin terms, positing a primary meaning and an extended secondary meaning for each term. (Leach (1957) has



attacked the genealogical basis of the definitions and has attempted to make the social status of the relationship the criterion for its definition. Lounsbury (1965) has very ably defended Malinowski's position but the debate does not concern us here).

The English glosses he gave to the kin terms represent his attempt to give some kind of objective meaning to them, to define them so that both native speakers and outsiders would be able to place the relationship. Malinowski makes the right assumptions in taking the individual family to be the nucleus of the kinship system; for in this way, without getting entangled with the social function and status of each kin type, he was able to show that it is possible to define the meaning of a term independently.

For example: according to Malinowski the term 'tama' means 'father' or 'mother's husband', but its extended usage comes to ultimately cover all senior males of the clan. 'Ina' is glossed 'mother', but its extended usages cover 'mother's sister' (MS) 'mother's brother's wife' (MBW) and ultimately mother's clanswomen.

Thus we see that Malinowski takes as the primary meaning the genealogically closest kin type from the class of those covered by the term, the others then being the extended referents, which are derived by means of whatever principles of semantic extension hold within the system.

Lounsbury (1965) has supported Malinowski's imprecise statements and insights with regard to defining the vocabulary

of kinship, by giving a formal analysis of the latter's data, stated in terms of semantic rules and meaning components. But it must be remembered that Malinowski himself was no componential analyst.

Having thus established the relevance of kinship studies for the overall understanding and analysis of lexical systems, we will now look at some well-known examples of such studies and show how the technique of CA came to be formally articulated through them.

### 3.3.1. The Technique of CA:

We have seen how the tradition of American descriptive linguistics had considerably narrowed down the scope of linguistics to only the observable formal properties of the language 'code', to the total exclusion of the context surrounding a linguistic event, and the message encoded in it. Both are however essential to a fuller study of language, and Lounsbury and Goodenough (1956) have attempted to show the relationship between them and linguistics by analysing the semantic problem of kinship terminology using techniques analogous to those already developed in linguistics viz. componential analysis.

Anthropologists assume that language is used in relating to the natural and social world, and as such it reflects the features of meaning contained in this world. But different languages might reflect different features or combinations of features depending on a people's world view.

Lounsbury (1956) points out that the features may be reflected either overtly or covertly in a language, but that they are recognized and utilized by a language can be readily seen by the existence of contrasting forms, the contrast being based on the presence or absence of a feature e.g. the male/female contrast in nearly all kinship terms.

Overt recognition of meaning features means that they are given phonemic identities. 'Covert' categories, which do not emerge as such at the surface level, but nonetheless play an operative role in distinguishing between the meanings of different forms, demand a different type of analysis. Lounsbury (1956) proposes to give them a special submorphemic status as components - since the description of the componential structure of contrasting forms, whether or not the contrasts are phonemically marked, is an important aspect of linguistic analysis. He further demonstrates how a direct semantic approach to componential structure is possible, based on earlier componential analyses of paradigmatic sets of affixed morphemes.

Phonemics had also made available to linguists two ways of defining any class or system: either by naming the members of a class e.g. all the allophones of a given phoneme, or by stating the defining features of the class, the necessary and sufficient conditions for membership in that class e.g. the distinctive phonetic features which are shared by a class of phones. Goodenough and Lounsbury merely extended and developed this technique so that it could be

used in the analysis of semantic systems. They chose the area of kinship as their example because it is an obviously structured system within which the demonstration of a componential analysis can be rendered in a readily comprehensible and meaningful manner.

Both followed a similar methodology in their analysis of Pawnee and Truk kinship systems respectively. After identifying the data they proceeded to define the relationships by asking questions like - what must I know about A in order to know that A is B's cousin? (or father, or uncle or whatever), thus segmenting the semantic field and identifying the members of the class. The next step was to derive from these definitions--by-naming, the distinctive semantic features constituting these definitions, so that the underlying structural principles are revealed. In this case, these principles could be constituted by the categories of relationship which underlie the many individual relationships; categories like sex of ego, sex of kinsman, differences of generation, lineal and collateral kinsmen etc. (Kroeber 1909). By scrutinizing the data of a particular kin system, the categories underlying it can be established e.g. the group of kin types MB, MMSS, MMB, MMMSds and a couple more <sup>15</sup> in Pawnee (Lounsbury 1956:171) fall under the class 'uncle'. It is seen that ego can trace this particular relationship entirely through females i.e. they are his uterine kinsmen and hence uterine vs. nonuterine consanguinity is one of the dimensions along which kinship is determined in Pawnee. Lounsbury (1956) shows how all these

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various relationships which fall under the class 'uncle' can be defined by the simple formula: male - uterine - kinsman - of ascending generation. These then are the underlying distinctive components in this case.

In extending the technique to more general vocabulary Chafe (1965:29) has described one way of determining whether a meaning is elemental<sup>16</sup> or complex viz. by comparing partially identical utterances. For example, compare 'my cat' with 'their cat'. The units 'my' and 'their' are isolated, but they are not elemental because the comparison of 'my' with 'our' yields the units singular and plural, while a further comparison of 'our' with 'they' yields 1st person and 3rd person. Thus 'my' is a complex unit composed of 1st person and singular while 'their' is composed of 3rd person and plural. A similar technique is followed by Bendix (1966) who believes that entry into the continuous semantic system can be gained at any arbitrary point. He, too, extracts components from oppositions in the step-by-step procedure of successive isolations of different segments or dimensions of the larger structure. Delimitation of lexical domain is not considered a necessary first step.

From all these studies of semantic and lexical structure, it emerges that far from being a random patchwork of information, the lexicon is a highly structured component whose underlying structural principles not only reflect the nature of a culture, but also the processes of learning, generalization, concept formation and perception (Lounsbury 1965:162).

### 3.4. Implications of CA for Semantic Theory and the Lexicon:

The technique of CA then, first used by Hjelmslev and Jakobson in the analysis of linguistic forms, had until recently been withheld from the lexicon. We have now seen that it was successfully employed by anthropologists for the semantic analysis of highly structured domains of the vocabulary, like kinship.

During the structural era and early transformational era, semantics was regarded as suspect, and was meticulously omitted from all linguistic descriptions. But such theories were rather lop-sided in their emphasis and could achieve only observational adequacy. The development of CA made formal analysis of the semantics of a word possible and gave linguistic theory a great measure of explanatory value. It enabled the semantic analyst to understand what criteria speakers of a language use to decide what term to use for a particular combination of concepts. As Goodenough (1956:196) put it: "The semantic analyst aims to find the conceptual units out of which the meanings of linguistic utterances are built."

The domain of semantics, the whole range of the meanings of items and utterances is so vast, that it becomes unwieldy to conduct any form of analysis within it, unless some delimitation is imposed upon the material. The paradigmatic approach to meaning using CA makes such study possible, since then the scope of the data is defined and it aims only at providing a minimal definition for a linguistic item - characterizing it uniquely in terms of its conceptual content.

The aspect of meaning it deals with is signification as distinct from connotation where the "signification of a linguistic form is composed of those abstracted contextual elements with which it is frequently but less than perfectly associated. These have definitive value. Significata are prerequisites while connotata are probabilities and possibilities" (Goodenough 1956).

The application of CA to the lexicon has led to greater understanding of the nature of the lexicon, its content and its structure. In being able to define words in terms of their semantic components, we can account for their syntactic behaviour, describe formally how different words get classified into subsets by virtue of sharing some component (semantic field), and how some words are defined in semantic oppositions with others (cf. 3.3.1 and 3.4.3). That is, different types of relations holding among lexical items can be formally accounted for.

The possibilities of the method of CA have been explored in greater depth in recent years and the method has been extended to areas in the lexicon other than those which form natural subsets, since these are not representative of the more loosely structured general lexicon. Bendix (1966) for one, has shown that the method can be successfully applied to less obviously structured lexical domains. His analysis of a set of verbs in English, Hindi and Japanese not only illustrates the adequacy of the method but has greater implications for linguistic theory, in that some of the



semantic components isolated have been employed cross-linguistically for purposes of translation. Also, the study has shown that it is possible for all three languages to formulate definitions of the selected lexical items in terms of different combinations of a small number of very basic semantic units. Thus another important implication of the CA of meaning is that the basic unit of semantic description is not the word, but a function, function being defined as a minimal component of meaning that is used in relation to a context.

#### 3.4.1. Semantic Tests and CA:

When making statements about meaning in various languages, linguists have often found it necessary to verify their analyses by cross-checking it against native speakers' intuitions about their own language. Even while investigating one's own native language it is better to consult the intuitions of native speakers other than oneself, to minimize the risk of coming up with an analysis of one's own idiolect. The practice of using semantic tests is meant to fulfil this need. But semantic tests, as Leech (1970:343) explains, should not be regarded as a means of discovering facts and analyses, but rather as a means of testing hypotheses. For a discovery procedure would mean, strictly, a procedure for deriving a linguistic analysis direct from data, a task generally held by linguists to be highly impractical (Chomsky 1957:51-3). But using tests as a means of confirming or disproving hypotheses set up within the context

of a theory is an accepted procedure of scientific investigation. The use of semantic tests in linguistic investigations can therefore be valuable only when used in the latter capacity, and it is this approach Leech takes in setting up his theory of semantic testing (Leech 1970).

Bendix (1966) has also made a valuable contribution in this field, though his work is experimental and he has administered semantic tests to speakers in an attempt to arrive at the 'componential' definitions of a set of verbs. His work has been criticized by Ariel (1967) and Leech (1970) on grounds of its lack of clarity about testing theory, and its apparent tendency to regard tests as discovery procedures, used "to find the meaning of forms" (Bendix 1966:18). But the latter criticism is undeserved, since his tests may be seen as an example of what Leech (1970:350 fn 6) calls 'field methods' - an iterative application of tests in the 'hypothesis-testing' sense. That is, on the basis of limited data, the linguist forms a generalization, based on either guesswork or his own intuition, which he tests by scrutinizing further data. This might lead him to make further predictions which in turn are checked against further data.

This is what Bendix means when he claims (1966:9) that his experiments demonstrate how tests may be used to yield the data which his definitions are meant to account for. Thus his tests are specifically designed to multiply the data on which a model can be built, although the choice of initial data is based on intuitive grasp of contrast which the test

factually confirms e.g. the choice of 'give' and 'lend' to be placed in syntagmatic contrast in "he didn't give it to me, he lent it to me."

Thus both Bendix (1966) and Leech (1970) regard semantic tests as procedures for confirming hypotheses. And the kind of tests they have used in their experiments are based on the supposition that cognitive meaning can be studied in isolation from connotative meaning - which is why it is possible to arrive at a minimal definition of an item in terms of its semantic components.

The procedure Bendix follows starts by administering interpretation tests of an exploratory nature in order to identify the component/s which distinguish the meanings of the forms contrasted. The identified features are then used in ranking-tests, but-tests etc. whose purpose is to unambiguously establish the status of the feature being tested, either as criterial or associative, i.e. the hypothesized components are tested with more rigorous multiple choice tests.

Example I. The test pair:

1. He's lost his watch, but he knows where it is.
2. He's lost his watch, but he doesn't know where it is.

Though both are difficult to interpret, (1) is preferable because it does not negate the inherent meaning of 'lost', whereas (2) is a self-contradictory sentence because a criterial component (not knowing/not intentional

which is being tested by this but-test) is negated (Bendix 1966:23).

Example II. Leech (1970:359) devised a test to determine whether the item 'friend' definitionally implies a symmetrical relationship. But only a very small percentage of informants were of the opinion that if Kenneth is my friend is true, I am Kenneth's friend also has to be true. This led the investigator to conclude that symmetry is not a component of the semantic description of 'friend', but is only an incidental fact sometimes associated with the meaning.

These tests, though yet of limited application, provide operational criteria for determining the actual meanings of lexical items and for identifying the semantic components of these meanings. But the term 'operational' must not mislead one into regarding them as discovery procedures.

The use of this technique of CA in the semantic descriptions of languages can be identified even in those theories which do not use CA directly. This is probably so because the value of any formal analysis is indisputable since such analyses are verifiable and can be subjected to precise criticism. Besides, formal semantic analysis not only addresses itself to finding out why certain phenomena exhibit regularity, but is also able to explain and demonstrate semantic regularities. It is for these reasons it has proved so useful in both linguistics and anthropology.

It is often claimed that CA made its way from anthropology to linguistics, but for a long time now a close

connection has been recognized between language and other aspects of culture like cognition and perception. Boas in 1911 suggested that an appreciation of the internal form of language was a proper first step in the study of folk psychology. It was this insight, coupled with the methodological rigour of descriptive linguistics which led to the development of CA and its use in anthropology, in the study of kinship terminologies. Because of the Bloomfieldian taboo on the study of meaning, the method was not widely used in linguistics until the advent of TG, and even then its full scope was not utilized. But as we have seen people like Bendix (1966), Chafe (1965, 1970), Leach (1970), and to some extent Lyons (1963, 1977) in his notion of structural semantics (cf. 3.4.2), recognized the potentialities of CA and used it for the analysis of the more loosely structured areas of the lexicon.

In this way, it would be true to say that the theoretical and methodological roots of CA lie in descriptive linguistics, though its actual development and growth took place in the field of anthropology. It returned to linguistics proper in the sixties as an enriched and fully-fledged technique of semantic analysis, and TG indirectly made extensive use of its principles in both syntax and the characterization of lexical entries in the lexicon.

#### 3.4.2. Relation of CA to Structural Semantics:

In so far as the actual practice and methodology of CA is concerned, it is possible to relate it to John Lyons'

notions of 'structural semantics' and 'semantic field'. We wish to include Lyons in our discussion because, first, in his earlier work he made use of Firthian notions of semantics and also drew on Chomsky's generative linguistic theory. And secondly, because his work represents the most original contribution to semantic theory to come out of British Linguistics since Ogden and Richards.

Let us first clarify what is meant when Lyons speaks of structural semantics. The principles of structuralism as they are commonly known in Europe stem from the Saussurean notion of structuralism and are basically compatible with Chomskyan generative grammar, especially when it is combined, as Lyons claimed, "with functionalism and universalism." The term (as it was used in the last chapter) has acquired a much different and narrower sense in the United States, where it tends to be employed with reference to the theoretical and methodological tenets of the Post-Bloomfieldians. In fact, for the Post-Bloomfieldians the term 'structural semantics' would have been almost a contradiction in terms, since they believed in excluding semantics from linguistics at all costs. The Saussurean structuralists held no such belief, and it is in their sense of 'structuralism' that Lyons uses the term when discussing 'structural semantics'.

The central thesis of this concept, which makes it very relevant to CA, is that every language is a unique relational structure or system, and the units which we identify or postulate as theoretical constructs, in analysing

a sentence (sounds, words, meanings) derive both their essence and existence from their relationships with other units in the same language system. And these units are but points in a system or network of relations, and have no prior or independent existence (Lyons 1977:231-2).

Keeping these principles in mind we find that the componential analysis approach to semantics is structural in the paradigmatic sense of the word. The meanings of the forms in a given language are presented as standing in opposition to one another within the system of the language, and they are distinguished by discrete semantic components, which act as distinctive features (as in phonology when characterizing a phoneme). We can infer this from the earlier discussion. The componential semantic analysis of natural subsets of lexical items, like kinship terms, has shown a structural approach in the paradigmatic sense - and has extracted adequate minimal definitions from the mutual opposition of the items in the subset. And these definitions consist of shared or contrasting features or components which distinctly characterize the word.

Words, utterances are so rich in meaning, and so many factors contribute to giving them their range of reference (context of situation, culture, environment, personal history of speaker etc.) that any formal study of their meaning would be rendered effectively impossible, unless some limits are imposed upon the material. CA aims to just minimally define a word, so that it can be

distinguished from all other words, and its lexical meaning can be established. (This seems to have been the procedure followed by standard dictionaries down the years, although they were not following a formally analytical method, i.e. CA could be looked upon as a formalisation of insights that have existed since no one knows when). Once words are analysed into components it becomes possible to determine which words share a component/s -- and these are then classed into a group, technically known as a semantic field (Lyons 1977). The field theory as it has come to be known, has mostly been concerned with lexical structure, but lexical structure, it must be remembered, is but one part of semantic structure.

There are two important dimensions of lexical structure -- the paradigmatic and the syntagmatic. And though initially they appeared to be in conflict, it has since been realized that they are actually complementary in nature -- as Lyons has shown in his discussion of the works of Trier and Porzig. The syntagmatic dimension of lexical structure is reminiscent of Firth's notion of meaning by collocation.<sup>17</sup> Collocationally restricted lexemes are syntagmatically related by means of an essential meaning relation. This could mean either that one lexeme is bound to occur with the other (cf. 3.4.3); or the sense of one is compulsorily associated in the meaning of the other. In cases of the latter kind of collocations, the sense of the syntagm is said to be encapsulated in the related lexeme. For example, the sense of 'with the foot' is encapsulated in the lexeme 'kick', although



the two are used simultaneously in a syntagm like 'she kicked him hard with her foot'. It is easy to see how an analysis of this kind of syntagmatic relation resembles the technique of CA, since 'with the foot' is a criterial component of the meaning of 'kick'. You cannot have \*"She kicked him with her hand/head/knee" etc. (These syntagmatic relations were what Post-Bloomfieldians had referred to as selection restrictions).

As Lyons points out, structuralism has frequently been associated with functionalism in 20th century linguistics, and the earlier discussion in this chapter provides some evidence of this. By functionalism is meant the view that the structure of every language system is determined by the particular functions it has to perform. For the sake of consistency we will illustrate this by the use of the conceptual field of kinship terminology.

It is safe to assume that kinship is a universal phenomenon, and that the semantic field of different types of relations among individuals is common to all cultures. Though it may vary in range and scope according to different social customs etc., kinship itself is just a continuum of meaning which is delimited into smaller units by different languages according to their cultural and social needs. And it is these differences in needs and outlook that account for the different lexical structures in different language systems; for different languages give structure to or articulate the continuum by lexicalizing

certain conceptual distinctions, thus giving lexical recognition to greater or less areas within it. For example, in English the lexical items 'nephew' and 'niece' cover areas which in Hindi would be lexicalized as 'bhanja' and 'bhatija' in the case of the former, and 'bhanji' and 'bhatiji' in the latter case. Or to take another example, the items 'uncle' and 'aunt' as they are used in English would seem to native speakers of Hindi to be highly generalised terms covering a wide area of kinship semantics which according to them needs to be, and can be, further specified; witness the many terms in Hindi that would account for the many relationships subsumed under 'uncle' and 'aunt' in English:

'mama'	—	mother's brother
'chacha'	—	father's younger brother
'tau'	—	father's elder brother
'mausa'	—	mother's sister's husband

And for 'aunt':

'mami'	—	mother's brother's wife
'chachi'	—	father's younger brother's wife
'tai'	—	father's elder brother's wife
'mausi'	—	mother's sister.

These relationships are the one's following from the immediate family of ego. There are yet others which in English would normally be subsumed under 'uncle' and 'aunt'.

Thus we see that, considered as a continuum, the substance of kinship is a conceptual area. It can be said to be a conceptual or semantic field by virtue of its

structural organisation by particular language systems, and the set of lexemes in any one language system which covers the semantic field and gives structure to it is then a lexical field.

### 3.4.3. The Status of CA in Anthropological Linguistics and in TG:

CA, then, is an important technique of lexical analysis; but, though most linguistic theories made use of it at some level or the other, the amount of recognition accorded to CA in these theories varied considerably. In this section we will briefly compare the status of CA in anthropological linguistics and in transformational grammar (TG), for though the latter theory will be discussed in the next chapter, it will be useful here to see why CA was able to play only a limited role in its lexical description, although it was through TG that CA gained formal entry into linguistics proper.

The admitted aim of TG theory is to simulate psychological reality, but in practice, the model cannot rise above its self-imposed constraints which have led it to make certain unnatural assumptions about the nature of language. One such is that the lexicon is considered a random set of items; any evidence pointing to possible structure in the lexicon is either shunted into performance or "psychologically unreal" redundancy rules are formulated to incorporate it in the theory. The possible usefulness of CA in this regard is not explored.<sup>18</sup> But CA was made use of to the extent that

it was relevant for describing syntax. Katz and Fodor (1963) and Bondix (1966) etc. had shown how lexical entries, regardless of their membership in a tightly defined set, could be characterized in terms of components or 'features'. And the feature device was useful for TG because it enabled the generation of grammatical sequences of lexical items by providing a means for describing the collocability of certain words.

Chafe (1965) had anticipated the usefulness of CA to syntax when he proposed that "if the manifestation of each unit is thought of as an infinite class consisting of all the tokens of the unit in question, then the manifestation of a complex unit can be thought of as the product of the manifestations of its constituent units. It is important to realize that it is the product and not the sum of these manifestations" (Chafe 1965:32-33). For example, in the collocation 'black cat', not all the points in experiential space which fall within the total manifestation of 'black' are included, but only those which fall within the manifestation of 'cat', also, i.e. if two units are to be meaningfully juxtaposed their components should be compatible.

The features selected by TG were those which were utilized in syntax. Also, certain syntactic properties were incorporated in the representation of word-meanings e.g. the syntactically indexed arguments of a relational<sup>19</sup> verb like 'lend' as in X lends Z to Y : — X HAVE Z and not Z IS OF Y and X CAUSE (Y HAVE Z) and not Z CHANGE TO (Z IS OF Y)

The XYZ arguments indicate the permissible NP's and their syntactic function. The selection restrictions further narrow down the range of possible NP's. In this way, the underlying feature representation of an item plays an important role in predicting its syntactic behaviour.

Also the ordering of the arguments is unique since any change of order would incur loss of grammaticality and meaningfulness.

e.g. \* The doll loves the girl  
                  Y                                  K

instead of K loves Y where Y is not necessarily + animate.

Hence we see that both underlying structure and surface system are explainable in terms of 'components' (cf. Chapter 4 for limitations of TG).

In TG, then, CA is used merely as a heuristic device and the criteria used for judging and evaluating its efficacy are just those which are used for judging the adequacy of the theory itself in the light of its goals. As such, its only usefulness lies in predicting syntactic behaviour and in participating in a rather simplistic kind of semantic interpretation. The theory does have the wider goals of psychological reality, explanatory adequacy etc., but the failure of CA in this regard is the failure of the theory as a whole.

In anthropological linguistics CA was expressly a technique of semantic analysis and was evaluated on the basis of psychological validity. Its aim was to discover the definitional or intentional meanings of terms for their native users i.e. CA was supposed to make statements about

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concepts in the natives cognitive world", (Wallace 1965:229) by using systematic, reliable techniques. The claim of psychological validity can only be substantiated if the results of CA are shown to be objective descriptions of an information process in which symbols received by the speaker **are** related predictably to symbols produced by the speaker. Wallace (1965) has shown how the results of CA can be empirically verified (and as we have seen, Bendix(1966) and Leech (1970) also formulated semantic tests for the same purpose, but keeping general vocabulary in mind and not just terminological sets).

Wallace (1965) correctly points out that terminological usage can be predicted adequately by several models, not all of which may be psychologically real, hence prediction of usage cannot be used as a relevant criterion for judging the psychological validity of a model. The question is how a native speaker decides on a particular term for a particular object, and hence the tests should be devised to elicit this information from a speaker. Wallace identifies three stages in this procedure of which the first two have direct bearing on the issue: (1) the selection of sufficient relevant information about the reference object, (2) the organising of the data so as to define the class of the object, and (3) choice of appropriate term.

The use of tests for eliciting information about the first two stages would reveal that there are some dimensions of information and logical operations within the domain under

investigation which the speaker cannot use, and others which he does use to decide upon the term. In this way, the reasoning process underlying the selection and use of terms can be determined. This criterion for judging its structural and psychological validity is embodied in the technique and assumptions of CA.

But the TG criteria for judging the validity of CA are purely utilitarian. The features it posits are not isolated on any naturally principled grounds but only those dictated by the requirements of syntax, since prediction of grammatical strings is its criterion of success. Psychological validity can be considered the least of its criteria for judging the validity of any technique, especially where semantic analysis and the lexicon are concerned.

That is, mere prediction of an event, what Wallace terms 'structural validity'<sup>20</sup> is not enough. A successful theory must be able to also replicate the psychological process by which a hearer arrives at a decision regarding a referent. Only such a theory would be said to have psychological validity, since it approximates the cognitive world of the speaker.

### 3.5. Conclusion:

The foregoing discussion is an attempt to trace the varying degrees of importance assigned to meaning in linguistics, and the development of techniques of semantic analysis since they have direct bearing on the understanding and

characterising of the lexicons of languages. The tradition of anthropological linguistics can in a very real sense be designated the ancestor of the present day theory of generative semantics (GS), in that they share common basic assumptions. The actual formal machinery of generative semantics, however was inherited from TGG, since it came into being as a direct consequence of the shortcomings of TGG. But, as we shall try to bring out in the rest of the work, GS represents a meeting point of two different strands of development, one directly traceable to anthropological linguistics; the other taking a more devious route i.e. Sapir's notion of 'Process' giving rise to the Item-and-Process trend of Bloomfieldian linguistics, which can be shown to be the ancestor of TGG. Generative semantics has made use of the transformational framework of TGG and made it operate on a semantic base -- to generate a more adequate description of language.



accordance with traditional grammar, one which lent it greater scope to achieve its goals.

We will begin this chapter with a discussion of the metatheoretical issues involved in a TGG, since such a background is essential to bring out the significance of the issues that will be discussed later in relation to the lexicon.

#### 4.1. Metatheoretical Issues:

Taxonomic linguists had a very impoverished conception of the nature of language, regarding it merely as a form of behaviour. It is so, true enough, but an understanding of it cannot be achieved by analysing it as behaviour alone. The behaviour is an overt manifestation of underlying knowledge and it is this knowledge that should be the subject matter of linguistics, what Chomsky terms 'competence' (1965:4). Linguistic theory is thus mentalistic since it is concerned with discovering the mental reality underlying actual behaviour. The insights of Bloomfieldian theory to a great extent tallied with this view<sup>1</sup>; but Bloomfield and his followers endorsed the empiricist view of scientific methodology, disregarding the need for theory and explanation, and it is the inherent limitations and inadequacies of this method that led to the failure of the taxonomic model.

TGG has its roots firmly embedded in traditional linguistics, and subscribes to the Humboldtian assumption that serious investigation of language use and processes requires a study of the underlying generative processes.

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It attempts to formalize a native speaker's intuitions about his language, and not just classify observable utterances, although the latter may be a source of data.

Post-Bloomfieldian linguistics with its emphasis on element and inventory and its elementary data processing approach to the study of language, did not even attempt to deal with the most fundamental characteristic of any natural language, viz. its "creative" aspect. It was committed to making just descriptive statements about a given corpus whereas knowledge of a language involves the implicit ability not only to understand indefinitely many sentences but also to (in Humboldt's words) "make infinite use of finite means" (i.e. a finite set of rules to generate an infinite number of sentences).

What taxonomists did was to impose some kind of structure on language in accordance with their extreme requirements of strict operationalism and reductionism, instead of displaying the structure language naturally possessed. As a result, it seriously underestimated the richness of language structure and was too oversimplified to account for all the observed facts.

The task of the grammarian is to construct a description and where possible, an explanation for the enormous mass of data in accordance with the linguistic intuitions of the native speaker (Chomsky 1965:20). Sentences display properties that cannot be explained by an analysis of surface structure alone.

E.g. (1) rām kā prasthān

Ram's departure

(2) rām kā ghar

Ram's house.

Both constructions are superficially similar, but the subject-verb relationship appears only in the former. To explain such facts, the linguist must discover the rather abstract system of rules that relate sound and meaning in a language, and the principles that determine the organization and functioning of these rules. Surface structure is often misleading and uninformative and our knowledge of language depends on properties of a much more abstract nature. Taxonomic and behaviourist approaches are "grounded in a belief in the shallowness of explanations", as though the understanding and acquisition of language is merely a matter of skill or habit-formation. Their surface-oriented analysis can at best be only observationally adequate since the grammatical relations obtaining in a sentence that contribute to its meaning can only be determined by its "deep structure", a concept that has no place in their theory. In fact, the difference between observational and descriptive adequacy (Chomsky 1965) can be said to be related to the distinction drawn by Hockett (1953) between "surface grammar" and "deep grammar", a distinction also recognized by traditional grammar, behaviourist accounts of language being largely confined in scope to the former. This is especially true of Post-Bloomfieldian linguistics and, to some extent, the London School of Firth, which emphasises the adhoc nature of language.

We thus see that the orientation of the two accounts of language, one based on language-as-behaviour and the other on language-as-knowledge, is fundamentally different. Descriptivism started out with the surface structure of utterances and analysed it at different levels. TGG starts with abstract entities to form an abstract syntactic DS, and then generates surface utterances.

In short, transformational grammars can be said to be explanatory in nature, since they attempt to explain the relation between different sentences in terms of the underlying grammatical relations. They also explain how a finite set of relations form the basis for the infinite number and variety of actual surface structures. Also, by positing the concept of DS, transformational grammars establish some linguistic universals and show that far from being infinitely diverse, different languages show similarity of organization, and that the conceptual framework to which they give form is common to all. This would explain why translations are possible, and why a child has the ability to learn the language of whichever linguistic community he's placed in. The cognitive framework thus provided by transformational grammars to explain language and approximate psychological reality has wider implications for psychology and related fields.

#### 4.1.1. Place of Semantics in a TG:

The question of what role semantics, or the study of linguistic meaning, should play in the construction of a grammar of a natural language, has been a crucial one in the history of linguistics. We have seen the extreme attitudes adopted towards this problem in the last two chapters. Anthropological linguistics was concerned with showing how the meaning of an utterance was primarily the function of its linguistic and non-linguistic context, while Post-Bloomfieldians rejected meaning altogether from their theory of language. Early TG went along with the latter view to some extent, not because semantics was irrelevant to a study of language, but because it was not as amenable to rigorous formalization as was syntax. Hence, making use of the loosely defined concepts of semantics would reflect unfavourably on the "scientific" nature of the theory. In Syntactic Structures, (1957) where Chomsky was concerned mainly with problems of syntactic description, semantics was considered from the point of view of the USE of language. However, from Aspects (1965) onward the emphasis changes, and transformational grammarians show greater concern with the interrelation between syntax and semantics in a competence model of grammar.

Traditionally, the distinction between semantic and syntactic phenomena was captured by the notions of the "dictionary" and "grammar", but the relation between them was not stated and the two were treated as separate entities. Such a theory cannot be descriptively adequate since it is

clear that a native speaker has the ability not only to construct grammatical sentences, but also to detect and explain semantically anomalous sentences and semantic ambiguities.

Transformational grammarians' solution to this problem was to posit a semantic component with a solely interpretive function. The input to this component was the deep structure strings of the syntactic component. The projection rules would assign a semantic reading to the DS based on the meanings of the individual lexical items contained in it, and the grammatical relations obtaining between them.

This kind of organization of grammar, in which the output of the syntactic base component constitutes the input to the semantic component, was necessitated by Chomsky's insistence on the autonomy of syntax. The base component with its capacity for defining deep structures occupies the central place in TG, the place assigned to semantics being peripheral in nature.

Some linguists though (McCawley, Lakoff, Fillmore) have argued that the boundary between semantics and syntax was a forced one and should be obliterated. Such a grammar would make semantics generative and define infinite sets of semantic representations in the DS to serve as input to the syntactic transformational component. Making meaning central would also be an intuitively more satisfying explanation of the language phenomenon. However, since Chapter V will be devoted to the discussion of "generative semantic" grammars, we will not pursue the matter here.

#### 4.1.2. Role of Lexicon:

Traditionally, language has always been studied along two dimensions - the grammar and the dictionary. While grammar reflected the patterns along which sentences were constructed, the dictionary listed all the words of the language (and their senses) which figured in these patterns, but which themselves did not display any pattern and had to be learnt.

Words are language specific entities and are the meeting place of sound and meaning. The dictionary is therefore invested with a very important function. Not only is it the reservoir of linguistic meaning but it is also intimately related to grammar by virtue of storing items which enter into grammatical relations with each other to form the sentences of the language. That is, it is the meeting place of grammar and meaning. (Knowledge of the world does not enter into it, the task being assigned to the encyclopaedia, although it is undeniable that such knowledge contributes to the understanding of linguistic forms and the presuppositions etc. underlying them).

Transformational grammarians are making the same distinction when they talk of syntax and the lexicon. The lexicon is the component which lists all the learned or idiosyncratic elements of a language along with the phonological, syntactic and semantic information characteristic to each of them. This kind of structure has certain advantages over the descriptive analysis of words. Firstly, information

pertaining to a word is more readily accessible since it comes in a "packaged" form. And secondly, it is possible to give much more information about a word in the form of features than by analysing it at different levels and stating all the environments it can occur in.

But TG deviated from traditional grammar in that it characterized the lexicon in a highly specialized and restrictive fashion. The TG lexicon was an impoverished version of the traditional dictionary, it no longer being the repository of meaning as well. Because the descriptivists' distrust of semantics was adopted fully by the syntacticists, the lexicon was made a part of the syntactic base, and the semantic features they were obliged to incorporate within it were exaggeratedly simplified so that they could fit into the overall syntactic framework. As we have seen, semantics was accorded an interpretive status, while syntax was the central, generative component of the TG model. But the lexicon still formed the link between syntax and semantics since it was the information furnished by the lexicon to the DS which formed a major part of the input to the semantic component. Such a model however, necessitated the positing of a "dictionary" in the semantic component, in addition to the syntactic lexicon in the base, thus leading to quite a bit of unnecessary duplication of information in the two. Also, many phenomena could not be explained which could have been adequately accounted for had semantic information been considered at an earlier stage in the derivation. That is,



the information contained in the traditional dictionary was divided and presented in two different components in TG.

#### 4.2. Structure of the TG Lexicon:

There are several versions of the TG theory to date, and predictably the lexicon as it was formulated in the Standard Theory (ST) has undergone modification. It has assumed the character of a waste-paper basket, since the attempt to simplify the transformational component has led to all sorts of information being dumped into the lexicon. This is done regardless of whether such diversity of information can cohere into an integrated whole within the framework of the constraints obtaining in this sadly misused component.

The structure of the lexicon as we shall present it here will basically be that set out in Chomsky's Standard Theory (1965), the only modifications admitted being those introduced by his Extended Standard Theory (EST). This decision is motivated by the fact that Chomsky's earlier version of TG still remains the most explicitly formulated theory of language. Besides, the formulation of the lexical sub-component in Aspects is the most coherent account available in the literature on the subject, even though Chomsky chooses to treat it under the heading "Some Residual Problems" (Chomsky 1965:Chapter IV).

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The lexicon consists of an unordered set of lexical entries and certain redundancy rules. The lexical entries constitute the full set of irregularities of the language, each entry being a composite of three types of features - phonological, syntactic and semantic. The redundancy rules add and specify features wherever these can be predicted by a general rule, i.e. considerations of simplicity and economy enter the lexicon in the form of redundancy rules.

The features are thus specified to provide four types of information:

- (1) Aspects of phonetic structure that are not predictable by general rule.
- (2) Properties relevant to the functioning of transformational rules.
- (3) Properties of the formative relevant for semantic information i.e. components of the dictionary definition, and,
- (4) Lexical features indicating the position in which a lexical formative can be inserted (by the lexical rule) in a preterminal string (Chomsky 1965:87).

The semantic features of (3) above were negatively defined as being those that were not involved in any syntactic rule (Chomsky 1965:142). Features like + Human, + Animate were also regarded as syntactic in nature because they played a role in the explanation and prediction of syntactic behaviour and because they figured in the selectional rules of the base.

These selectional rules and also the strict subcategorization rules of the base introduce features into the DS which are used in generating complex symbols. The feature matrices of the lexical entries must then contain those features which are compatible with the corresponding complex symbol, i.e. the contextual features (of item (4) above) of the lexical entry which replace a complex symbol are non-distinct from it.

Thus we see that the issue of semantics in the lexicon was deliberately brushed aside, because Chomsky claimed in Aspects that they were not in a position to describe and evaluate the relationship between syntax and semantics. Later modifications of the lexicon within the TG framework persistently ignored semantics, being mostly concerned with redundancy rules and morphological processes. What was then originally a methodological shortcoming soon assumed the status of a theoretical constraint, and the fact that it was ignored was taken to mean that it did not form part of the theory.

The lexical entries were, therefore, independent units which formed a disjunctive set, the semantic and morphological relations holding between them being formally stated by redundancy rules. But, as Chomsky pointed out, in any linguistic system, lexical entries enter into intrinsic semantic relations (semantic fields, antonymy, polysemy) of a systematic sort which cannot be described in a natural way within the framework of independent lexical entries.

#### 4.2.1. Similarity with Bloomfieldian Lexicon:

In spite of the apparently revolutionary nature of the Standard Theory lexicon, it shared certain characteristics with Bloomfield's description of the same device.

Syntactic categories played a fundamental role in the discussion of Aspects and Bloomfield too was preoccupied with the identification of categories. Categories are large form-classes which completely subdivide the lexicon, or some important form-class. It is necessary to describe words in terms of their form-class, since such information is fundamental to syntax, each word or morpheme being a learned unit arbitrarily assigned to a form-class. Bloomfield too defined the lexicon as a list of basic irregularities.

For Bloomfield though, the lexicon was not quite so wide in scope as the ST lexicon. It did not contain any rules, and morphological analysis was handled outside the lexicon (as it still is in some TG models). Only irregular forms such as 'oxen' were listed, regular functions being stable for whole form-classes, in a mass. Further, Bloomfield nowhere mentions that the phonological features of a form were to be provided by its lexical entry, though one suspects this may have been implied.

Characterization of the form-class of each item was the central concern of the lexicon. Bloomfield maintained that "form-classes, like other linguistic phenomena, can be defined, not in terms of meaning but only in terms of linguistic (grammatical and lexical) features" (1933:268).

That is, it was more "scientific" to accept identification in formal terms than to depend on makeshift definitions of meaning.

Form classes (= categorial features) were not mutually exclusive but involved lots of cross-classification, hence lexical items were assigned to subclasses as well - to fully describe their syntactic behaviour. Selection features (Bloomfield's term, similar in function to Chomsky's selectional restrictions) entered the picture in the form of these subclasses e.g. the division of personal pronouns into the categories male:female to account for the selection of he:she or him:her; or the division of nominative expressions into singular/plural or substantives/marked infinitives (1933:269). Lexical features ~~were~~ also present as being those which described the positions in which the form can occur e.g. 'I' occurs in subject position, 'me' in object, as in 'I watch' and 'watch me'. These are the equivalent of Chomsky's lexical features (Chomsky 1965:113).

Bloomfield also mentions another property of lexical forms - that of class-cleavage - which enables them to exhibit unusual combinations of function, e.g. 'egg' as a bounded Noun "the egg" or a mass N "spilled egg on his necktie"; or 'man' as a bounded male N, that can also be treated as a proper N, "Man wants but little" (1933:265). Bloomfield does not show how this is to be marked in the lexicon, just uses this as evidence to emphasize his point that grammar includes taxemes of selection by which every lexical form is used in

certain conventional functions. The problem cropped up later in generative grammars, whether to treat items like the above as two different words, or to derive the meaning of one from the other.

We thus see that of the 4 types of information provided by the lexicon (cf. 4.2), the Bloomfieldian lexicon provides at least (1) and (4). It further resembles the ST lexicon in being an appendix of the syntactic component, since in both theories, the primary function of the lexicon is to store information which will facilitate syntactic analysis.

#### 4.2.2. Open-endedness of Lexicon:

Even the ideal speaker's lexicon is not a closed finite set of entries. It is subject to change and expansion. The creative nature of language is not confined to the ability to produce an infinite number of sentences using a finite set of rules; it also applies to the creation of new vocabulary items. The lexicon should reflect this tendency by accounting for "accidental semantic gaps", in the sense that such gaps correspond to lexical items that the language does not provide for specifically but which could nevertheless be incorporated without any alteration of the constraints within which the component functions.

Neologisms are very much a part of competence, although perhaps not all can be explained by the structure of the lexicon - be it by means of lexical rules, affixations or combinations of semantic primitives. It is, however,

erroneous to regard them as manifestations of performance, since that would be refuting one of the basic principles on which the lexicon is based -- its open-endedness. Hudson (1976) argues that there is no necessary connection between regularities in the existing vocabulary and the creation of new items. This may very well be true, and in particular one cannot use the possibility of extending the vocabulary as evidence for the existence of rules in the speaker's lexicon. But we would value that theory more whose lexicon was so structured that apart from characterizing and generating existing lexical items, it could, using the same machinery, explain possible lexical items as well.

In principle, Chomsky's syntactic redundancy rules make allowance for such "possible but non-occurring lexical items." But in actual practice, the TG lexicon can account only for rule-governed creativity by means of inflectional and derivational rules i.e. it provides for the creation of new items only by means of familiar morphological operations.

Most neologisms though, are unique lexicalizations of new combinations of semantic primitives. As Leech (1974) puts it: "'Lexicalization' is the process of 'finding words' for particular sets of semantic features and has the psychological role of 'packaging' a certain semantic content, so that it can be manipulated syntactically as an undivided unity". If this is so, the atomist approach of generative semantics is perhaps more suited to account for "possible lexical items."



#### 4.3. Syntactic Issues and their Relation to the TG Lexicon:

##### 4.3.1. Relation between Lexicon and Grammar:

In both standard theory and EST the lexicon is a syntactic component, its function being to assist the generation of syntactic DS by storing lexical items in terms of those characteristics that are relevant for syntactic purposes. Semantic issues in the lexicon were oversimplified so that some kind of clear theoretical boundary could be maintained between syntax and semantics.

In Syntactic Structures (1957) lexical items directly replaced a category symbol generated by the phrase structure rules

e.g.  $N \rightarrow \text{'boy'}$ ,  $V \rightarrow \text{'hates'}$ .

But later TG no longer contained such rules to rewrite lexical categories as formatives. Instead, the lexical categories were expanded into complex symbols (CS) by means of subcategorical rules. These CS were then matched with and replaced by lexical entries stored in the lexicon; each entry being a pair (D, C) where D is a phonological distinctive feature matrix 'spelling' a lexical formative, and C is a collection of specified syntactic features (a complex symbol). The use of the CS in syntax had several advantages, the chief one being that it overcame the difficulty with regard to application of rules to items that are cross-classified. Further the separation of the lexicon from the base rules was a useful way of simplifying the grammar, since now

many of the grammatical features of a formative could be specified in the lexical entry, only those features which serve as categories being generated by the base rules. Also many idiosyncratic features of the formative e.g. its morphological properties, syntactic features like object-deletion etc. can be listed in the lexical entries where they seem to naturally belong. The lexicon thus serves as a very significant device for the simplification of the grammar.

But although the lexicon lists words and the word is considered to be the meeting point of form and meaning, the connection of the lexicon with the semantic component is an indirect one - via the syntactic DS.

We thus see that the lexicon is a crucial link component which is instrumental in the integration of the various components of a theoretical description of a language. It is the lexical entry which is the basis of both syntax and semantics and which is therefore characterized so as to form the input for both syntactic rules and interpretation rules.

The relationships between lexical entries are stated within the lexicon itself by means of redundancy rules, so that a lexical entry is fully specified only after it has been supplemented by whatever information is available through redundancy rules. These rules are nongenerative in nature and can refer only to information present within the lexicon. The transformational component gains access to the lexicon only by means of the lexical subcategorisation features.

#### 4.3.2.. Regularities in the Lexicon:

Two considerations govern the organization of content in the lexicon: pragmatic and aesthetic. Since it is the memorized part of a grammar, a principle that indicates what has mnemonic value would be a principle governing the lexicon e.g. how individual lexical items relate to each other intralinguistically and are definable in terms of other lexical items. Such a principle is the simplicity criterion, its purpose being to indicate what sort of tendencies exist in the lexicon: (1) it reflects the principle of word extension (2) the tendency of the lexicon to use as frequently as possible elements it already contains, and (3) adds to the predictive power of the grammar (Gruber 1976). It is for this reason that significant regularities observable across lexical items are extracted and stated by rule - so that they can be predicted where necessary. All fully productive processes, such as past -tense formation by suffixation, are of course, handled outside the lexicon (but even such processes have lexical exceptions e.g. go + past → went/\*good) (Beard 1977). This was the original motivation for the positing of redundancy rules in the lexicon; and it meant that lexical entries could be specified only for distinctive features.

The presence of redundancy rules in the lexicon widened the scope of the latter to some extent. Since the Aspects model laid emphasis on the phonological and syntactic features of a lexical entry, there were also two types of

redundancy rules -- the phonological redundancy rules and the syntactic redundancy rules. The phonological rules were certainly significant with respect to the above criteria for simplicity. For while providing a fuller specification of the D part of the lexical entry (D, C), they also defined the notion "phonologically admissible" in a way that conformed to known facts. But this ability to define "phonological gaps" was not the motivation for their existence. They were selected in accordance with an independently motivated evaluation procedure for phonology (minimization of feature specification: Halle 1959) and made an active contribution to the explanatory adequacy of the theory..

But there is no such justification for syntactic redundancy rules. As Chomsky (1965) observed, these rules do make a distinction between possible but non-occurring lexical items and impossible ones, albeit in purely formal terms. But for this distinction to be significant, as in the phonological case, it must be shown that it corresponds to "accidental" and "systematic" semantic gaps in the lexicon of a language. Hudson (1977) argues further along the same lines and points out that there is no necessary connection between the sub-regularities found in the existing lexicon, and the patterns found in newly created words. In fact, the output of these redundancy rules (which are basically statements of semi-productive processes) by definition matches the already existing vocabulary, since its purpose is to provide a fuller specification of the 'C' part of the

entry (D, C). Hence it cannot be used to extend the vocabulary - and this possibility, as we set out above, was one of the reasons for extracting regularities. Thus according to this argument at least, redundancy rules do not add to the predictive and explanatory power of the lexicon. The available literature on the formalization of the theory of redundancy rules has mostly been Jackendoff's work so far, and in Jackendoff (1974) lexical rules are used not for part of the derivation of lexical entries but for the "evaluation" of the lexicon - the evaluation measure being the minimization of independent information in the lexicon. It would seem then that the theoretical justification of syntactic redundancy rules is not too sound, and that they are valuable only as a device for reducing the number of units of independent information in a lexical entry.

Hudson (1977) also refutes the second reason set out above and argues against stating sub-regularities in a grammar at all. For the present, however, it is enough to say with Chomsky that, "Consequently, it is an open question whether these have the significance of the phonological redundancy rules" (1965:169).

#### 4.3.2.1. Disjunction in the Lexical Entry:

The type of regularity reflected by redundancy rules is only one of two types; the other is reflected by means of internally disjoint lexical entries - of the type proposed by Chomsky (1970). These 'neutral' entries combine

all the lexical information of the base form as well as the derived form e.g. refuse/refusal, criticize/criticism, into a single lexical entry, thus expressing the minor regularities that exist between them. That is, the partial similarity of form which is matched by partial similarity of meaning and syntax is captured by the lexical entry itself. This information is too specific to be stated by rule. But the derivational relation between the two lexical items is stated by redundancy rule, since the relation is sufficiently productive to form a minor subclass, e.g.  $V + al \rightarrow N$  or  $V + ism \rightarrow N$  (and it is precisely when a class begins to form that we suspect a rule is at work).

But conjoining such disjunctive sets of features into a single entry creates problems for lexical insertion. For example, since refuse/refusal are entered in a single entry, the entry as a whole will get inserted into the base phrase-marker - but the decision as to which set of alternative features is to be phonologically realized depends on which set is chosen by the insertion rule, N or V. There is no provision for such selection in Chomsky's lexical rule (1965: 84). However such provision can in principle be made within the theory (Hudson 1976:92) so that instead of all the disjunctive sets of information which are stored together in a single entry getting inserted together as well, only the relevant one is selected by the lexical rule, which is framed so that it is sensitive to the context of the lexical node as well.

This modification is also necessary on other grounds. Since the disjunctive sets of information imply different contextual features, it is important that only the relevant set be inserted, there being some transformations that make use of them. The insertion of lexical features therefore requires an apparatus that can select among the features in the lexicon. This solution however spoils the simplicity of Chomsky's original approach since the lexical rule now inserts just parts of the individual lexical entries.

Jackendoff (1974) proposes a slightly different treatment of derivationally related items. He argues in favour of having a separate fully specified entry for each derived form, and then relating them by means of a redundancy rule which extracts all that information from the derived form which can be predicted by the entry of the base form. He thus has the following entries for decide/decision:

/ decīd / + V + [NP <sup>1</sup> — on NP <sup>2</sup> ] NP <sup>1</sup> DECIDE ON NP <sup>2</sup>
--

/ decīd + ion / + N + [NP <sup>1</sup> 's — on NP <sup>2</sup> ] Abstract result of Act of NP <sup>1</sup> 's deciding NP <sup>2</sup>
--

They are related by two redundancy rules i.e.  
the morphological M and semantic S redundancy rules of the  
form:

$$\begin{array}{l}
 \text{M : } \left[ \begin{array}{c} / Y + \text{ion} / \\ + N \end{array} \right] \Leftrightarrow \left[ \begin{array}{c} / Y / \\ + V \end{array} \right] \\
 \\
 \text{S : } \left[ \begin{array}{c} + N \\ + [ \text{NP}^1 \text{'s} \text{ --- } \text{on, of} ((P) \text{NP}^2) ] \\ \text{Abstract result of act} \\ \text{of NP}^1 \text{'s} \text{ --- } \text{Z-ing NP}^2 \end{array} \right] \Leftrightarrow \left[ \begin{array}{c} + V \\ + \text{NP}^1 \text{ --- } \text{NP}^2 \\ \text{NP}^1 \text{ } \underline{\text{Z}} \text{ NP}^2 \end{array} \right]
 \end{array}$$

According to Jackendoff this helps to eliminate the prediction of non-occurring base verbs like \*retribute and \*aggress, and does away with Lakoff's rather suspicious device of the Absolute Exception.

But this solution makes the grammar unnecessarily more complex by repeating information in the derived entry and the related redundancy rule. The sole purpose of the repetition seems to be to state that the information in the derived entry can be predicted by the information in the related base form, and hence is not to be counted as independent information. We will have more to say on this issue in Section 4.3.3.

In any case the redundancy rules only specify the relationship in a very general way. There is no way to predict that the /decid/ in the two entries is the same, since no specific cross-reference is involved, and consequently that most semantic features are common to both. If at all a



separate lexical entry is needed, all it should provide is the specialized meaning of the derived form, the rest of the information being made available by its relation to the base form, the morphological change being effected by generative rules.

#### 4.3.3. Lexicalist/Transformationalist Controversy:

Problems of word-formation<sup>2</sup> – both derivational and affixational – have always posed a challenge to linguists. Before any of the theories we have dealt with so far were proposed, linguists involved in word-formation investigations dealt mainly with either diachronic problems or strictly morphological ones. But the processes of word-formation represent classes of sub-regularities, and therefore any adequate theory of word formation must explain how syntactic form and semantic value come to be associated, and also where the rules which generate them are located. Besides, the study of word-formation provides important insights into the structure of any language.

The inadequacy of the structuralist accounts of derivations of words stemmed basically from their taxonomy-oriented methodology which does not provide a means of explaining and predicting how word-formation operates to generate neologisms. Besides, these accounts were incapable of defining the syntactic/semantic relationship between derived forms and the sentential context in which they occur. e.g. budgetary from noun budget, so that the relationship

of the former to all the nouns which it may specify can be determined: budgetary crisis, — item, — matter, — year; or for that matter in Hindi: the adjective gharelu, "pertaining to household", determining gharelu stri "homely woman", — jhagRā, "domestic quarrel", — māmlā, "domestic affair", — vātāvaran, "homely environment."

The semantic readings of such relational adjectives (Non-predicating adjectives according to J. Levi 1978) cannot be predicted by structuralist accounts, which also fail to integrate word-formation into any unified theory of language.

But with the appearance of the TG theory of language, the approach to word-formation changed. Lees (1960) in "The Grammar of English Nominalizations" gave rise to what has come to be known as the Transformationalist Hypothesis.

The transformationalist approach together with the Katz-Fodor-Postal interpretive semantic model offered a way to generate productive derived forms, by means of transformations, from underlying base forms which had already been assigned semantic readings at the DS level. e.g. Derived nominals like 'construction', 'destruction', 'refusal', 'betrayal' etc. were derived from the corresponding V-forms by transformations which essentially generated the morphophonemics of the derived form.

But very few word-formation processes are fully productive, and they involve more than a mere addition of the relevant suffix. The derived form acquires additional semantic material which the transformations do not provide.

Thus the transformationalist theory too fell short on many counts as an adequate theory of word-formation. It could not provide precise semantico-syntactic predictions e.g. in the case of the relational adjectives mentioned above (incidentally, even the lexicalist theory cannot satisfactorily explain it), nor could it clearly relate word-formation to the grammar as a whole, especially to the lexicon.

Thus the two major shortcomings of the transformationalist theory as Chomsky sees them are: (1) The rules of the model are too strong since derivations are not as productive as say gerundives or participles. Therefore to make the correct predictions the relevant transformations would be subject to a complex system of constraints, and all the derivational morphemes would also have to be marked for such constraints in their lexical descriptions. And (2) the transformations generating derived forms would not be capable of predicting the lexicalized meanings of such forms where they exist. Hence words with lexicalized or idiomatized meanings would have to be listed in the lexicon anyway. And it would seem that most derived words fall into this category.

Chomsky (1970) therefore proposed a "new" model, the lexicalist model, to overcome the shortcomings of the transformationalist theory.

#### 4.3.3.1. The Lexicalist Hypothesis:

In the early works on transformational grammar, the correctness of the transformationalist position was taken

for granted, there being no alternative as this theory of grammar was formulated at the time. But with the extension of the TG theory to incorporate a separate lexicon and syntactic features, an alternative solution to the problem of word-formation by derivation became available. Thus whereas the transformationalist theory made the transformational component more complex to accommodate derivational processes, the lexicalist theory enriched the base (categorical component + lexicon), generating derived words at the DS level itself. The idea behind the whole exercise was that the enrichment of one component would permit simplification in other parts of the theory, the choice of the component to be enriched being based on purely empirical evidence - i.e. which account would provide a simpler and more natural explanation of the phenomenon under consideration, and also lend itself to wider application.

The starting point of the lexicalist hypothesis proposed in Chomsky's "Remarks on Nominalization" (1970) is the rejection of the position that a nominal such as Bill's refusal of the offer is derived transformationally from the sentence Bill refused the offer. This was based on the considerable number of differences between derived nominals and "gerundive" nominals such as Bill's refusing the offer. Chomsky (1970) cites plenty of evidence to show that derived nominals and gerundives have different origins, although both are products of processes of nominalization which have applied to the same verb form.

The differences were enough to justify the separation of the two processes and to make the distinction between syntactical and lexical derivation, which Chomsky advocated in his article and which Kurylowicz had recognized in 1936.

The lexicalist solution was to generate derived nominals directly by the base rules under an NP node. They were stored and inserted in their derived form, while gerundives and other forms which were derived by productive rules were generated at a later stage in the transformational history.

Such an accounting is naturally possible within the structure of the EST lexicon with some extension of the available machinery. Whereas in pre-Aspects work generalizations concerning distributional properties of base forms and related derived forms could be expressed only in terms of syntactic transformation, the syntactic features of the TG lexicon provide a great deal of flexibility for the expression of the same distributional regularities. The common lexical entry for the base and derived forms had a "neutral" feature structure i.e. it had fixed strict subcategorization and selectional features but was unmarked for the categorial features [N] and [V]. That is, the related entries have the same features in the lexicon, but the selection of features to be inserted depends on the lexical category with which they are to be associated. Class is thus assigned by the end nodes of the phrase-marker into which they are plugged by the lexical rule. The lexical entry however, specifies

that semantic features are in part dependent on the choice of one or another of the categorial features N, V, Adj (cf. Section 4.3.2.1).

The lexicalist hypothesis thus makes a principled differentiation between the two types of nominalizations, explaining their difference as a consequence of their structure. The distinction it defines between syntactical and lexical derivations has wider implications and application for the processes of word-formation.

#### 4.3.3.2. Productivity in the Lexicon:

The issue here (in lexicalist theory) is basically that of productivity in the lexicon. That is, there are certain relationships between lexical items that can best be accounted for by postulating a set of lexical rules possessed by the language-user; but it is important to distinguish these relationships which can be characterized by productive rules from those which cannot, since each represents a different aspect of the competence of the native speaker.

"Productive" refers to a process which accounts for a speaker's ability to form and understand new words. In Chomsky (1970), —ing forms are derived by a productive syntactical rule, as are also forms derived by rules like:

(3) type / retype

(4) hook / unhook

(Thompson 1975:332).

Chomsky (1970) is, however, mostly concerned with non-productive derivations which he lists in the lexicon and directly generates in the base. He assumes that all --ing forms can be derived syntactically. But this division of the two nominalization processes is not so simple e.g. singing belongs to three distinct syntactic categories:

(5) His {singing} {stopped}  
 (The) {song} <sub>N</sub> {was good}

(6) The {singing} <sub>Adj</sub> bird  
 NP

(7) He {was singing}  
 {sings} <sub>V</sub> well.

By deriving sing+ing transformationally, the common source is not obliterated, but it is not possible to predict where the item will occur as a noun or adjective, since the preceding category is the same. Admittedly the following category is different -- followed by V in (5) and by N in (6). This however creates problems for syntax. The item's environment is predicted on the basis of position in a construction, and each position is identified as a paradigm of potential items. Singing (gerund) and song (noun) are members of the same paradigm, but the relation between them is ignored in lexicalist theory. Also, the different grammatical functions of singing cannot be predicted, since each analysis is separate. The only consistency is in the morphological

break up and the -ing inflection which is common to many verbs. That is, even in the case of fully productive cases the lexicalist solution is not very satisfactory.

Non-productive relationships would be lexically derived, since the native speaker cannot form new words based on their patterns. All that speakers know in such cases is that a relationship exists which also holds for other pairs of words, though each such pair has to be individually learned. But even though such relationships are not productive, the burden on the memory is considerably lightened, as pointed out in Jackendoff (1974) if pairs of words which are semantically related are also morphologically related.

Some examples of the two processes in Hindi are:

### I. Non-Productive

- |  |                                       |
|--|---------------------------------------|
| i) $\check{s}uru_V/\check{s}uru\check{a}t_N$                             | "begin/beginning"                     |
| ii) $padh_V/padhai_N$  | "study <sub>V</sub> or read/to study" |
| iii) $ur_V/ur\check{a}n_N$   | "fly/flight"                          |
| iv) $sahan_V/sahan\check{s}il_{Adj}$                                     | "endure/tolerant"                     |
| v) $prabh\check{a}v_N/prabh\check{a}v\check{s}\check{a}l\check{i}_{Adj}$ | "influence/influential"               |
| vi) $prakriti_N/pr\check{a}kritik_{Adj}$                                 | "nature/natural".                     |

### II. Productive

- |                                       |                     |
|---------------------------------------|---------------------|
| i) $gir_V/girn\check{a}_N$            | "fall/to fall"      |
| i.e. $V + na \rightarrow N$           |                     |
| ii) $ghar_N/gharv\check{a}la_N$       | "house/householder" |
| i.e. $N + v\check{a}la \rightarrow N$ |                     |



- iii)  $\bar{u}par_{Adj}/\bar{u}parv\bar{a}la_N$  "up, above/one who is from above"  
 i.e.  $Adj + v\bar{a}la \rightarrow N$
- iv)  $\bar{p}\bar{i}_V/\bar{p}\bar{i}nev\bar{a}la_N$  "drink<sub>V</sub>/one who drinks"  
 i.e.  $(V + na) + v\bar{a}la \rightarrow N$

In the lexicalist theory productivity in the lexicon concerns only the regular aspects of the non-productive relationships entered in it. Jackendoff (1974) is the only one who briefly touches on the question of productivity by suggesting that a speaker internalizes a number of redundancy rules which reflect lexical relationships.

"... once a redundancy rule is learned, it can be used generatively, producing a class of partially specified lexical entries" (1974:36).

But as we have pointed out elsewhere, the problem with this suggestion is that the redundancy rules are not designed to be 'used generatively'. Besides, it is not appropriate to consider the rules which account for a speaker's productive capacity as simply redundancy rules used generatively, since this does not allow a distinction to be made between a productive process and a non-productive relationship.

e.g. M-rule:  $\begin{array}{ccc} prabh\bar{a}v & + & \check{s}\bar{a}l\bar{i} \\ +N & & \end{array} \longleftrightarrow \begin{array}{c} prabh\bar{a}v\check{s}\bar{a}l\bar{i} \\ +Adj \end{array}$

"influence"    "ownership marker"    "influential"

This is a non-productive relationship since new words cannot be formed on the same pattern, and the items

related are already separately entered in the lexicon. But a productive process like +vāla "ownership" can be used generatively:

1(a) for Nouns:

$$\left\{ \begin{array}{c} N \\ (V+na)_N \end{array} \right\} + v\ddot{a}la \Rightarrow \begin{array}{l} N + v\ddot{a}la \\ V + na + v\ddot{a}la \quad N \text{ or } Adj \end{array}$$

(b) for Adjectives:

$$Adj. + v\ddot{a}la \Rightarrow N \text{ or } Adj.$$

These rules capture a speaker's ability to combine morphemes in a productive way, by specifying possible combinations. But they say nothing of those aspects of the new word that can be called "inferential" (Thompson 1975).

e.g. gharvāla "one who owns a house"  
saravāla "one who lives in the street"  
 not \*"owns it".

The difference in meaning can be inferred on the basis of our "knowledge of the world" since we know that people do not (normally) own streets. (That is, selectional restrictions are not just a matter of stating grammatical features (Fillmore 1970); they also contribute to the meaning of a word). The application of a productive process is blocked only when a suppletive form already exists. e.g. since prabhāvāli "influential" exists, one cannot have \*prabhāvāla "owner of influence"; and since imāṇḍār "honest" exists \*imāṇḍārivāla "one who has honesty" is blocked.

These rules, then, may be stated outside the lexicon; but the latter must provide us with the basic meanings of morphemes like yāla, and certain general conditions for their combination, both syntactic as well as semantic. The actual message then conveyed by the new form will be a combination of the information provided by the lexicon and the speaker's knowledge of the world.

#### 4.4. Morphology in TG:

##### 4.4.1. Shortcomings of the Lexicalist Hypothesis:

The lexicalist hypothesis had several consequences for linguistic theory, the most important one to concern us here being that it made a distinction between lexical and syntactical derivation and permitted a (derivational) transformation to be reformulated as a lexical rule, thereby increasing the power of the lexicon. Chomsky had identified two different types of nominals and showed that both could not be derived transformationally since derived nominals exhibited a variety and idiosyncrasy of the sort that is characteristic of the lexicon.<sup>3</sup> Advocates of EST extended the hypothesis to mean that all transformations with lexical exceptions may be reformulated as lexical redundancy rules in the lexicon, thus complicating the lexicon while simplifying the transformational component (Bresnan 1976). Much recent research in the theory of grammar has tended toward the conclusion that many of the relationships between sentence

types that were once considered appropriate for transformational treatment should instead be described in terms of distinct but related lexical items, inserted into distinct but related underlying structures, the relation being stated by redundancy rule.

Wasow (1977) shows that such a radical application of the lexicalist hypothesis arose because some of the functions of T-rules can be fulfilled by lexical redundancy rules as well. He sets out some criteria for distinguishing between the two types of rules which would also provide a principled way of choosing between a lexicalist and a transformationalist analysis, and also demonstrates why it would be unwise to reformulate all structure preserving T-rules as lexical rules. Further, he shows how a linguistic theory, which incorporates both grammatical transformations and lexical features with redundancy rules can use both to advantage provided it does not blur the boundary between their respective functions, or attempt to abandon one for the other.

A strictly lexicalist analysis such as Jackendoff (1975) is possible within EST where even derivations are listed in the lexicon separately from lexical stems. Such an approach theoretically avoids the semantic problems of derivation, but only at the expense of losing generalizations and generativity, while increasing the redundancy in the lexicon.

Jackendoff precipitously develops Chomsky's redundancy rules into separate morphological and semantic rules to

be situated in the lexicon. Since these rules are not generative but simply mark a mutual relationship of equivalence that exists among entered lexical items (by means of  $\leftrightarrow$  = is lexically related to), it follows that all derived lexemes must be fully specified in the lexicon independently of the rules which reflect equivalences of meaning and form among them. Jackendoff's redundancy rules are therefore in reality vacuous (Beard 1977:308). That is, "they mark only superficial regularities among lexical items without finding the (semantic) motivations behind these regularities, let alone working those regularities into any overall theory of grammar" (Ibid:fn. 4).

e.g. M-rule 
$$\left[ \begin{array}{c} / Y + \text{ion} / \\ + N \end{array} \right] \rightarrow \left[ \begin{array}{c} / Y / \\ + V \end{array} \right]$$

While this marks the morphological relationship, the S-rule marks the semantic relationship obtaining between the N and V — the two types of rules being formulated separately for a given pair of items related by the rule  $V + \text{ion} \rightarrow N$ . Hence there is no way to show the relation between the rules themselves. Such a theory effectively denies the relationship between classes of lexical forms and classes of lexical meanings and is therefore unable to capture the direct association of form and meaning in symmetric derivations, e.g. words derived by adding the prefixes *dis* under ' etc. or suffixes like *+ity* or *+ify*. These are not fully productive and involve a semantic shift in the derived forms, hence must

be handled in the lexicon. But a lexicalist treatment of them would not capture the constancy of the meaning/form relation between them. It can, however, obviously accommodate "semantic-morphologically asymmetric" derivations (term used by Beard. 1977:309).

Another shortcoming of redundancy rule lexicalism, pointed out by Mays (1975) is that it involves listing as independent entries all the output items of partially productive derivation rules. He has argued that such listing will be impossible since the number of such items is almost infinite. These shortcomings lend additional support to Hudson's (1976) contention (cf. 4.3.2) that redundancy rules have a weak claim to the theory of language. But as Beard points out, lexical relationships must be stated somewhere in the grammar and he provides a solution by positing generative lexical rules which are formulated in terms of semantic classes.

Another problem facing the lexicalist theory is that of syntactic-semantic asymmetry. Chomsky (1970) raises it in mentioning denominals that receive the -able (or -ible) suffix e.g. knowledgeable, reasonable, habitable. These seem to be semantically related to HAVE-type derivations like grassy, hairy etc. But the suffixes are different, i.e. the same meaning is realized by two different forms. There is no way to show this within lexicalist theory.

In fact -able adjectives pose other problems as well. For example, the formula  $V_{tr} + \text{able} \rightarrow \text{Adj}$  accounts for the

morphological relationship between say read and readable, drink and drinkable etc. But \*gettable, \*fetchable would be rejected as unacceptable. The rule thus operates within certain constraints, but there are no phonological, morphological, syntactic or semantic properties of the lexical items concerned in terms of which we can predict its applicability. The lexicalist would thus list all -able adjectives in the lexicon. But there is no denying that the process is extremely productive since there are some morphologically specifiable subclasses to which it seems to apply without restriction, e.g. those whose stems end in -ize or -ify. It would therefore seem to be unreasonable to take the view that all -able adjectives be listed in in the lexicon (Lyons 1977).

A possible solution could be to allow the process to apply without restriction in the grammar, while transitive verbs which are exceptions can be marked in the lexicon. Lyons (1977:529 fn. 10) quotes Hasan (1971:152): "this suffix -able can be used with that set of verbs which can realize the process "reaction" in an active transitive clause where two participants are required but where the role "affected" can be mapped only on to the subject .... this explains why one may say Jim is a likeable fellow but not Jim is a puzzleable fellow." Some such non-syntactic solution may be possible.

Botha (1968) deals with a similar problem involving asymmetric derivations in Afrikaans, and suggests a phonological dictionary and matching rules to overcome it, while

Beard (1966, 1978) proposes the separation of derivation from affixation.

Then there is the problem of ostensibly derived words with no obvious base form. Chapin and Chomsky give examples of qualitative adjectives like legible, portable, possible. There are similar cases of nouns like butcher (\* butch ?) and verbs like report, record, repent, reject etc. Although these are easily accounted for as lexical items, there are cases of underived relational adjectives (J. Levi's non-predicating adjectives) such as civil (rights, war, defense) which present the same semantic problems as the derived budgetary (crisis, year), and which do not have any derivational provenience which could predict their senses, since the meanings of these adjectives vary with the nouns they determine. The only possible solution within the lexicalist framework would be to cross-reference every relational adjective and noun from which a relational adjective could be derived, with every other noun in the lexicon with which it may occur in order to capture a semantic reading (Beard 1974). This is a highly unfeasible solution. The problem is not really syntactic but semantic in nature. Since the individual words are already present in the lexicon, it is only semantic rules that can account for their specialized combinations. Lexicalists have dealt only with derivations with direct morphological and syntactic manifestations. Judith Levi (1978) considers the problem of relational adjectives to be similar to the semantic



problem of compound nouns, and attempts to formulate a solution for them within the generative semantic framework.

One final problem which faces both lexicalists and transformationalists is that of rule-ordering, i.e., the cycling of rules of derivation and/or suffixation so that derivations receiving more than one suffix will be derived with the proper set of meanings and suffixes in the proper order. e.g. In English "the -tion rule must apply to -ize derivatives, the -ize rule to -al derivatives, and the -al to -tion derivatives, an untenable situation under linear ordering" Chapin (1970:59) e.g. coeducationalization.

The problem which faces a linguistic theory is therefore not simply that of deciding whether a lexical item can or cannot be generated by rule. The theory must account in as systematic a manner as possible, and using whatever devices are available, for various kinds and degrees of derivational regularity. And little progress has yet been made toward the solution of this problem within the framework of transformational grammar.

#### 4.4.2. Shortcomings of the Transformationalist Hypothesis:

A generative theory is addressed to 'rule-governed' creativity to the extent that it generates all possible sentences; hence it follows that in the lexical domain it would try to account for how lexical items are related.

Creativity in language, as we have seen, consists of all types of productive processes - fully productive,

semi-productive and non-productive. The first and the last don't seem to present any unsurmountable problems for TG - the first because TG theory is geared to handle just such processes, and the last, e.g. N-formations involving +th (in English) like breadth, strength etc. can be accounted for by stating the general pattern in syntax and by marking the handful of roots which follow it, in the lexicon. But the semi-productive derivation processes like N-formation by means of +ion or +ness, and processes of compounding can neither be freely stated in the syntax, nor are the lexemes which figure in these rules sufficiently delimited in number to make listing or marking in the lexicon a practicable solution. And exclusive adherence to either treatment will incur valuable loss of generality and obscure the very valid distinction between the three kinds of productivity recognized in natural languages.

- I. Although Chomsky himself would disagree with the 'transformationalist' treatment of lexical derivations, the hypothesis conforms strictly to the reductionist principle evident throughout transformational syntax (witness all related actives, passives and question constructions etc. reducing to the same deep structure). It treats the semi-productive formations as just a special type of process in the syntax, which describes how two or more morphemes combine to yield a surface form. But as Dik (1969) observed, more often than not the derived complex word contains a semantic

aspect not present in the proposed underlying structure; or, it may be that semantic aspects present in the underlying structure do not get associated with the derived form. It is this type of additional semantic information that the hypothesis has trouble in accounting for.

e.g. English agent nouns like signer, singer are transformationally derived from structures containing the corresponding verb: John is the signer of the check is a transform of John signs the check. But in this 'underlying structure' the tense is present, while signer can also be used in the past tense as in John is the one who signed the check (Dik 1969:378).

Matthews (1974) also gives several arguments against the transformationalist hypothesis within the TG framework:

- II. The central point of the hypothesis is to deny to the lexeme more than a superficial reality, because it makes sense to view complex lexical items which seem obviously related to or derive from a common root lexeme, as analysable entities. But the trouble begins when these items are analysed within a purely syntactic framework, without taking into consideration the semantic issues involved.

e.g. the derivation of a great actor and a good athlete: in both cases, according to a transformationalist analysis, the underlying structure could

be [HE ACTS GREAT] and [HE ATHLETES WELL]. In the former case great is given a semantically adverbial function in the abstract deep structure since it modifies the verbal sense of actor instead of the noun itself. This could then be said to parallel the latter example where good acts on the verbal sense of athlete.

This is possible when the derivation of the agentives actor and painter is represented as

[an -ER [THE -ER ACTS ]].

So far so good. But as Matthews (1974:184) wonders, how are poet or artist or pianist represented? Possibly as:

[AN -ER [THE -ER PIANOS]]

or [ARTS] or [POEMS] or whatever.

But many semantic criticisms can be brought to bear against such an analysis. A poet may be one who [POEMS] but an artist is not one who just [ARTS], but, in the normal sense, [ARTS] in a particular way - which can be roughly characterized as [ARTS GRAPHIC]. The deep structure then, must be specially marked with other modifiers like [THE -ER ARTS LITERARY] to prevent it surfacing as the agentive artist.

Also, for example, lexemes like 'the surrender of the garrison', or 'the arrangement of the flowers', though syntactically equivalent are semantically distinguished in that the former refers to the FACT of the surrender while the latter to the WAY the

flowers are arranged. Such amendments and subdivisions can be added indefinitely, which only means that though technically the theory is capable of establishing more and more abstract deep structures, in reality it creates problems of explanation instead of explaining anything. Dik (1969:381) reaches the same conclusion when he claims that "far from reaching results which are intuitively convincing, transformational descriptions of derivatives and compounds often lead to derivational complexities the explanatory value of which is in many cases extremely doubtful, and, in some, downright non-existent."

- III. This is also evident in the transformationalist solution to compounding which consists of explaining the process by analogy with syntactic constructions. e.g. Blackbird has Modifier + Head arrangement, while a Jack-in-the-box parallels (a) pen in the box. But compounding processes involving Adj + N and especially N + N constructions are always semi-productive and often lead to lexicalization.<sup>4</sup> Hence they cannot be dealt with on a par with productive syntactic constructions, though in some cases it is so difficult to distinguish between the two that criteria from all levels, not just syntax, need to be resorted to, be they semantic, phonological or morphological.

This approach of the transformationalists to semi-productive linguistic processes was later caught up in the wider movement of "generative semantics", which provided many valuable insights into the semantic motivations underlying them, thus leading to a better understanding of the structure of language.

#### 4.4.3. Status of Morphology in TGG:

The extreme syntactic bias of TGG has led not only to an inadequate treatment of semantic issues, but has also been the cause of laying insufficient emphasis on questions of morphology. If the study of the morphology of a language is to be at all significant, it is essential that a distinction between word-structure and sentence-structure be maintained.<sup>5</sup> In the Post-Bloomfieldian Item-and-Arrangement model both were a matter of linear arrangement of elements, the only possible difference being one of size-levels, whereas what is required is that the model should assign a central role to the word so that word-boundaries can set some limit to the formulation of inflectional rules. In the IP model discussed in Chapter II word boundaries are morphologically significant in that there is one initial allomorph that is taken to be basic. However since the statements in IP are essentially transformational in nature, the inflectional structure of the word is described in terms of its syntactic elements.

I. Matthews (1972) disagrees with this kind of TG treatment of morphology. According to him if a theory is to make any meaningful descriptive statements it must allow some concept of inflectional structure which is independent of the patterning of elements of syntax. Further, it is necessary for the theory to recognize the word as a significant unit of analysis, because only then can the inflectional elements associated with it be treated as "simultaneous" elements (components in a sense e.g. singular, passive) instead of "sequential" in nature, as in IA (thereby lumping them together in the same class as the word) (Matthews 1972:126).

Matthews also points out, very relevantly, that since different languages raise different morphological problems, they may also require different sorts of description. It is therefore possible that the word is not universal - it has certainly been depreciated in recent literature and is not even mentioned in Chomsky (1965). But it can still be defined as a valid unit for languages in which it exists or the morphology of which requires that such a concept be posited e.g. inflecting languages (Matthews 1972:155). The status of the word in TG though is rather ambiguous: is the lexical item, as it is represented in the TG lexicon, equivalent to a root word from which other items of a paradigm can be said to be derived by rule?

It seems to be so in some cases e.g. plural formation or past-tense by inflection in English. Yet in the lexicalist hypothesis, derived forms are also listed as lexical items. Are they then, different lexical items with their own paradigms, or just different words belonging to the same paradigm?

The question is nowhere resolved in TG. And since the "derived" words in TG are thus not derived at all, perhaps it would not be incorrect to say that any "word-formation" in TG is effected by the morphophonemic rules which apply at the tail end of a derivation to yield surface forms. Morphology in TG, then, is over-simplified to deal with the formation of members of productive classes only. Since in the lexicalist framework all "derived" items involving some semantic shift are listed, the morphophonemic rules involved in generating them from a root form are rendered unnecessary. But this simplification of the morphological component does not add to the predictive power of the grammar, **nor does** it make it descriptively more adequate.

Bowers (1969)<sup>6</sup> and Matthews (1972) both argue in favour of recognizing some entity as a basic root word (or prime) which cannot be explained further in grammatical terms. Both take the word to be such a prime and deplore the fact that TG ignores the existence of such a useful device. Bowers uses it



as a base for word-formation processes (as do other transformationalists), and Matthews for inflectional morphological processes.

- II. "If such primes can be established there will clearly result a simplification of the most complex feature of the present model — the lexicon" (Bowers 1969:520). By extending the role of the lexicon ostensibly to include all unpredictable items and idiosyncratic information about them, the predictive power of the TG theory becomes very limited.

If items like abstract nouns and other derived forms can be generated by non-lexical rules, there is clearly no point in listing them lexically. Besides in cases of abstract nouns (Bowers 1969) some well-known ambiguities can also be explained by assigning distinct sets of T-markers to different meanings. In such a situation, the descriptive power of the model is greater than if the same semantic information had to be indicated as separate multiple selection rules within the lexicon. Deriving such forms by regular processes also reveals their relationship with other structures. The lexicalist theory thus clearly falls short of the goal of descriptive adequacy.

In Aspects itself, while considering the generation of items like sincerity, frighten etc., Chomsky (1965:186) concedes that entering such items directly in the lexicon would be an unfortunate decision,

since from the point of view of both phonological and semantic interpretation, it is important to represent the internal structure of these words. Yet he later advocated the lexicalist solution for formations involving semi-productive processes, in spite of his earlier misgivings.

Such a treatment of word-formation seems to be wrongheaded for a grammar whose major claims are to universality and predictiveness. In its consideration of productive processes TG seems to be tied down to trivial restrictions of actual occurrence rather than by the more important consideration of what constitutes a possible lexical item. TG thus tends towards a grammar of performance, which is a weakening of the general linguistic theory which the model represents. And by virtue of listing only those items that are to be found in performance, it is adequate only at the observational level. It cannot account for creativity at all and any word-formation treatment within it is just a farce.

- III. Another point to be noted is that in "Remarks" Chomsky emphasizes that there is no a priori criterion for the balance to be made in a grammar between the lexicon and the syntax: "the proper balance between various components is entirely an empirical issue." According to Bowers however, this is not so, and generality

should be such a criterion - in that one set of T-rules which accounts for a large number of derived nominals is to be preferred to a list of separate entries.<sup>7</sup>

- IV. Finally, let us see how far it would be appropriate to consider universality as a relevant criterion for the evaluation of a theory. Especially with morphology, a blind application of the criterion would seem out of place, for different types of languages require different treatments. But insofar as it is possible to formulate a theory which can yield adequate grammars for several languages, universality is a desirable criterion for evaluation. TG purports to achieve some measure of universality - but the way it sets about "explaining" word-formation defeats this purpose. From the TG treatment it would seem that word-formation processes were unique in every language. Yet this is not so. Word-formation processes in Hindi and English show a remarkable degree of similarity - barring lexical differences. C.g. there are inflectional morphemes for noun, verb and adjective formation from nouns and verbs in both languages formed by combining root + affix (provided the concept of a basic root word is accepted). And the different semantic features involved in the actual building up of the new item are taken from a common semantic vocabulary.

A related problem is that of ordering and sequence in cases where surface ordering of the elements of the sentence can vary. e.g. In English surface ordering is reflected in the TG deep structure. Should the deep structure be bound in this way to surface representation? (i.e. SVO, SOV order etc.). Such a dependence would reduce the universality of a theory.

As generative semanticists have argued, there is no genuine break between a representation of the meaning of a sentence and its various representations in syntax. That is, the deepest level is the semantic interpretation itself. If such is the case, then there is no reason for reflecting the 'surface' sequence at this level at least (ordering can be introduced at some later stage). Such a treatment would have the added recommendation of making the deep structure **more** 'universal', and reducing the diversity among languages by providing them with a common semantic base.

#### 4.5. Conclusions:

Keeping in mind the psychological hypothesis associated with the transformational theory, it would not come amiss to say, in the light of the foregoing discussion, that while TG could make some claim of paralleling psychological processes in its description of fully productive and non-productive formations, it cannot do the same for the intermediate area of semi-productivity. Nor can it afford to ignore it, since the historical development of languages

forces us to recognize its existence. But the mere fact that controversy is rife within transformational theory over how best to handle this phenomenon, and its treatment of derivatives and compounds as analysable entities, reflects a correct insight into linguistic creativity.

Perhaps the lexicalist and transformationalist hypotheses individually or even together, cannot describe convincingly the phenomenon of semi-productivity, and may be one will be driven to positing very general and seemingly far-fetched semantic predicates for 'explaining' derivation; but the fact that at this stage tools for formalizing the insights are not available to us should not deter us from expressing (informally) whatever insights we feel we have gained into any aspect of this complex phenomenon called language.

TG errs in that, having narrowed down its sphere of operations, it expends all its energy in devising means for describing even recalcitrant data within it, instead of widening its scope. It is a mistake to look at language only through the eyes of one particular school, instead of borrowing insights and methodology from other schools - if they have succeeded in handling certain linguistic notions in a better way. Our earlier chapters have shown the value of the insights gained by non-transformational schools, and their relevance for generative grammars. And our discussion of the generative semantic theory in the next chapter will show

how it attempts to integrate all these varied insights into a generative model.

Transformational generative grammar, then, is not the only approach to linguistic description. Although it has much to offer to the field, within the lexical context at least, as we have seen, it can be criticized on many points and would do well to be more receptive to ideas from elsewhere.

## CHAPTER V

## GENERATIVE SEMANTIC THEORY

## 5.0. Introduction:

At the close of the last chapter we saw that the TG lexicon is faced with several serious shortcomings and inadequacies and there are many aspects of a speaker's competence that it cannot explain. Many of the problems arise because of the basic assumptions on which the TG theory is built and because of its failure to formally recognize the role of semantics in the description and explanation of the language phenomenon. The sharp line drawn between syntax and semantics at the level of deep structure is counter-intuitive and leads to many theoretical tangles, also to unnecessary duplication of information in the deep structure and the interpretive semantic component. Further, the lexicalist approach of individual and unrelated entries in the lexicon can at best be only observationally adequate where reflecting certain types of relatedness between lexical items is concerned - a sad fault in a generative grammar. Hence, obliterating the boundary between syntax and semantics by equating semantic representation with the deep (or 'deeper') structure, and at the same time characterizing the lexical entry in terms of semantic tokens is a natural 'next' step. Thus, in a way, generative semantics is an

inevitable development from TG. Admittedly, as an explicit, formally defined model, TG does not have a parallel. But after all, the task of a grammar is to display the underlying mechanism of a language in use, and not to impose an unnatural, even if desirable, formalism on it in the interests of elegance.

In this chapter we will be concerned with showing how a generative semantic (GS) treatment of words stands a much better chance of explaining certain types of systematic relations between lexical items than does TG, or any of the earlier theories discussed in this work. The word is given a more central role in GS, although the lexicon as a whole retains the basic structure of the TG lexicon, as regards phonetic and syntactic features. But it has a much wider scope so as to incorporate the semantic structure of lexical items as well. As such the GS lexicon is descriptively and explanatorily more adequate.

Our aim here is not to compare two theories with a view to establishing the superiority of one over the other, but to show how the lexical description of one is capable of explaining more data than is the lexicon of the other, and how this explanation is in accordance with native speaker intuition.



### 5.1. Motivation for GS Theory:

There is an inherent connection between grammar and semantics which does not hold between grammar and phonology; and this fact should be captured in a model of a language system. The first explicit proposals for an integration of syntax and semantics were made by Katz and Fodor (1963) which were later modified by Katz-Postal (1964). The modified version was taken over by Chomsky in his Standard Theory, which imposed a spurious parallelism between semantics and phonology by making both interpretive and non-generative. K-P's approach to the problem was evident from their slogan "linguistic description minus grammar equals semantics", semantics being thus assigned a residual status. Such a view presupposed that all information relevant for semantic interpretation was available in the syntactic deep structure; and the lexical items as they were represented in the lexicon, and their grammatical relations with each other in the DS determined the full linguistic meaning of an utterance.

Such a view is seriously inadequate in many ways, and one of the more important questions it raises is whether or not there exists a boundary between syntax and semantics - a question of crucial importance for the lexicon since it forms a meeting ground for the two.

There are two important dimensions along which this question can be discussed - the nature of selectional rules and the role of semantic features - issues which

also figured prominently in the split of Transformational Grammars into interpretive and generative semantics.

In Aspects Chomsky conceded that syntactic and semantic considerations cannot necessarily be sharply distinguished; but, because of the lack of a semantic basis for making the relevant distinctions, he negatively defined a "semantic" feature as being one that did not figure in any syntactic rule (Chomsky 1965:144).

The concept of feature as a distinctive non-segmental element, first developed in phonological theory and later adapted to syntax and semantics to solve the problem of cross-classification, assumed a great deal of importance in GS theory, one of whose main contributions was the decomposition of words into semantic components. Tests have been devised to discover and justify semantic features (Lipka 1972, Weinreich 1966, Chafe 1970 and Cruse 1973) and "a semantic feature should be regarded as firmly established only if (a) it is intuitively convincing (b) it is detectable contextually (including syntactically) and (c) it can be shown to have explanatory value" (Cruse 1973: 15f).

In the TG lexicon features like Human, Male etc. were considered to be syntactic since they played a role in syntactic rules, and one assumes that they did double duty when the same features were made use of to assign semantic interpretations to linguistic structures. For Chomsky never specified what the TG semantic features looked like.

This was a serious lapse because quite, apart from the role they play in semantic interpretations, semantic features are also of importance in specifying and explaining many kinds of lexical relations which form part of a native speaker's competence. One such instance is word-formation (dealt with in detail in 5.3.2), where they provide a basis for explaining the fact that complex lexical items differ semantically from the sum of the meaning of their components. Listing them in the lexicon may provide observational adequacy but such a solution cannot be descriptively adequate, for the creation of complex lexical items entails the addition of semantic features. That is, once complex lexical items are created and used repeatedly, they become lexemes in their own right (perhaps with a loss of analysability) and require certain specific semantic features (Lipka 1975:205). e.g. compound forms which have now become lexicalized in Hindi:

<u>paRhā</u> <u>likhā</u>	"read write" →	educated
<u>khātē</u> <u>pītē</u>	"eating drinking" →	well-to-do (family).

These forms could initially have been accounted for transformationally but in present day spoken Hindi, they are used as independent lexical items. This process of lexicalization differs slightly from that found in GS. Both involve an underlying meaning like "someone CAUSES something to become (a) lexical (item)." In GS the "something" refers to prelexical semantic elements while in Lipka's

usage (as in Marchand 1960) it refers to observable morphemic elements which combine to form a new lexical item that becomes a semantic unit. In both cases, however, semantic features are of crucial importance to explain "lexicalisation" – a process involving addition of semantic features over and above those already present in the items that combined – an aspect that has been overlooked by the lexicalists.

The other issue that helped in causing the split in Transformational Grammar was the nature of selection rules which subcategorize a lexical category in terms of syntactic features and define a selectional relation between grammatically related elements in a sentence. Selectional relations essentially apply between two lexical items e.g. what kind of subject or object a given verb can take. This was the Aspects position later challenged by generative semanticists.

In later work in TG itself, an alternative treatment of selectional rules (SR) was adopted, notably by Jackendoff (1972). Chomsky (1965:157) had suggested the possibility of incorporating SR's into the semantic component, and when later the theory was faced with the criticisms that (1) it could not account for focus, presuppositions etc. and (2) that there were sentences where the violation of a SR originated in a modifier of an NP rather than in the head Noun e.g. \*"My pregnant neighbour is the father of two girls" (McCawley 1968), – some revision was indicated. Jackendoff (and Chomsky's EST) achieved this by extending the scope of

the semantic component to enable it to assign readings of focus, presupposition etc.; and allowing the grammar to refer to it at levels other than DS. He also assigned the function of SR's to the semantic component, thus retaining its interpretive status.

McCawley (1968a:134) had however observed that "... selection restrictions are definable solely in terms of properties of semantic representation." But at that time he did not suggest following the alternative treatment of SR's also mentioned by Chomsky (1965:158), viz. that generative syntactic rules take over the functions of the semantic component thus obliterating the difference between the two components. This line of thought did not assume relevance till after McCawley, Lakoff and others re-examined semantic representation, the semantic structure of lexical items, and the role of the DS in TG - and advocated the removal of the boundary between syntax and semantics. This they did by making semantic representation the underlying level of linguistic structure, thus giving birth to the generative semantic theory.

The semantic structure of lexical items, which had been glossed over by TG, assumed significance when R. Lakoff (1968) showed that most of the syntactic features were semantically motivated and that there were many semantic markers which did not function in syntactic rules. This and later evidence argued in favour of the semantic

decomposition of lexical items, characterizing them as complexes of semantic material.

It is not as if such an idea was entirely revolutionary when it was first explored by generative semanticists. Chomsky (1965:160) states that "the very notion 'lexical entry' presupposes some sort of fixed universal vocabulary in terms of which the objects are characterized." Also Chomsky was fully aware that in any linguistic system, lexical entries enter into intrinsic semantic relations of a much more systematic sort than his theory was equipped to account for. It is just that in the enthusiasm generated by the proposal of the 1965 model and in the ensuing mass of publications, his doubts and tentative suggestions were ignored. It was left to the critics of the TG theory and to the generative semanticists to point out that there are many systematic relations between lexical entries which cannot in any natural way be described within the framework of independent lexical entries, and there are many aspects of a native speaker's competence which TG theory fails to take note of.

The interrelation of syntax and semantics is by no means a settled issue even today, and GS solutions to problems of TG are not necessarily correct. But, as we shall try to show in this chapter, this theory holds out greater promise for meaningfully and naturally relating semantic and syntactic issues, and providing more intuitively

appealing explanations to certain lexical phenomena, notably word-formation, lexicalization, homonymy and polysemy.

#### 5.1.1. Is GS a Notational Variant of TG? :

Denials of the relevance of semantic information for syntactic rules have persisted since the development of the structural tradition in linguistics, so much so that Chomsky has called generative semantics a notational variant of TGG in spite of its non-syntactic orientation. This however is a claim that cannot be substantiated. One of the basic assumptions on which TGG is based has been overborne by GS, viz. that syntax is generative, and the grammatical relations obtaining between items at the DS level are sufficient to understand and interpret a sentence. But this DS as we saw is highly impoverished and the GS school establishes pretty convincingly that it **is** semantics which determines syntax; also that the DS, which was originally an artificial level set up for methodological convenience, has been erroneously accorded the status of a theoretical construct, as became evident once it was subjected to critical scrutiny.

(1) One important linguistic fact to which a semantics-based grammar gives formal recognition is the existence of case relations (Fillmore 1968). In his discussion of the items "hitting" and "breaking", Fillmore points out that part of our knowledge about each verb in our language consists in knowing the "kinds" of NP's it

can occur with, e.g. 'break' can occur in construction with any of the combinations of noun phrases representable by the formula:

(Agent) (Instrument) x

(Fillmore 1970:123).

The notions "deep structure subject" and "deep structure object" have no relevance in such an approach, since the correct explanation is arrived at only by taking surface structure cases into account.

Such an analysis is strongly motivated by semantic considerations. It also makes it possible to make semantic distinctions in a fairly direct way in the DS.

That the notions of subject, object, etc. have a great deal of explanatory value is evident from the fact that they have been employed in descriptions of natural language grammar for generations. Also, TG with its syntactic bias feels the need to make use of such notions or similar ones in terms of "Thematic Relations" (Wasow 1977; Jackendoff 1972, 1976; and Anderson 1977). Yet it is significant that in the theory of TG itself the following statement holds: No transformational rule can refer to notions like subject etc., i.e. the base rules cannot express relations like subject-verb agreement, which are well established linguistic facts (Postal 1976:151).

The empirical deficiency of TG in this regard has however been obscured by the fact that much of the



descriptive work done within it has ignored this condition. Transformational grammarians have done nothing to eliminate this inconsistency.

Other innovations introduced by GS which prohibit considering it a notational variant of TG are:

(2) There is no distinct boundary between syntax and semantics and both kinds of representation have the same formal nature.

(3) Lexical items are not inserted all at one time, hence it is not possible to define a deep syntactic structure (McCawley 1967).

Drawing on these conclusions, McCawley proposed that semantic representation be considered the underlying level of linguistic structure, to be related to surface structure by a single system of T-rules (1968). Such a conclusion and the assumptions on which it was based gave rise to empirical consequences significantly different from TG. One such was that the meaning of certain lexical items could be represented adequately only by decomposing the items into smaller semantic components. A great deal of evidence to support such an analysis was provided by Morgan (1969), McCawley (1968b), Binnick (1968), Green (1974) and Fillmore (1970), who showed semantic decomposition to be syntactically motivated.

Such a view of the lexical item, which defines it as an encoding or encapsulation of semantic material, also

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makes it possible to classify lexical items in terms of their conceptual interrelatedness (Fillmore 1970:132) and to pass semantic judgement on sentences that can be directly accounted for in terms of this relatedness.

Besides, it also becomes possible to define the premise of a seemingly "irregular" rule in terms of the semantic class to which the lexical items which govern it, or are exceptions to it, belong.

The proposal is intuitively appealing for another reason. As Green (1974) points out, the position—that all differences in syntactic properties between two lexical items are presumably based on semantic properties—contradicts the belief that the lexicon is an arbitrary collection of the exceptions of a language. For what the semantic decomposition approach does is to provide "an independently motivated generalization which accounts for the 'exceptional' character of that item" (Green 1970:66). That is, individual lexical items are not wholly capricious, and their participation in syntactic rules can be shown to be governed by the semantic features which characterize them—what Fillmore (1971) terms the "happiness conditions" for their appropriate use.

Another consequence of the GS theory is the widening of the scope of competence. Langendoen (1971) argues that the scope of competence must be extended to include knowledge about the use of language and Weinreich (1971) suggests the inclusion of the ability of speakers to impose semantic interpretations on sentences that are

to impose semantic interpretations on sentences that are semantically, and even sometimes syntactically, deviant. Chomsky (1965) had forwarded an explanation for this ability in terms of the violation of selectional rules and the fact that sentences like "misery loves company" can be interpreted by direct analogy to well-formed sentences. But generative semanticists have shown that SR's themselves must be formulated in semantic terms; and R. Hall (1973) has pointed out that there are other cases of apparent violation which are nonetheless perfectly and unambiguously interpretable, and can be explained by means of semantic transfer -

e.g. He smoked a sad cigarette.

She tapped the floor with a tentative foot.

## 5.2. Criticism and Defence of the "cause-to-die" Analysis:

Fodor (1970), Kac (1972) and Shibatani (1972) have pointed out some shortcomings of McCawley's analysis of the causative verb 'KILL', in which he derives the verb from an underlying sentential representation "cause to die" or "cause to (become not alive)" (McCawley 1968). Briefly, the main arguments against the derivation are

(1) Asymmetry of causative verbs like melt<sub>tr</sub> / melt<sub>intr</sub> with regard to the do-so transformation.

(2) Deriving surface verbs like 'kill' from the same source that underlies surface verbs like 'cause' leads to the generation of ungrammatical sentences, because the

constraints on the time adverbs do not match.

i) John caused Bill to die on Sunday by stabbing him on Saturday.

ii)\* John killed Bill on Sunday by stabbing him on Saturday.

(3) The third argument Fodor presents against McCawley's lexicalization and predicate-raising transformations is that they can be saved only at the cost of abandoning a well-supported generalization, "that a structurally necessary and sufficient condition for a NP being shared with an instrumental adverbial is that the NP be the deep subject of the verb that the instrumental modifies."

(4) Another piece of evidence against McCawley's analysis centres around the notion of "modification". McCawley (1972) however notes that it is possible for an adverb to modify a piece of semantic structure, e.g. to modify not "John killed Harry" but "Harry not be alive" or some other part of its meaning.

(5) Shibatani (1972) has pointed out that in Japanese the notion of modification goes counter to McCawley's case, because derived causative verbs and lexicalized causative verbs in Japanese display radically different behaviour, and the differences indicate that underlying structures of clauses containing derived causatives have embedded clauses, while underlying structures of clauses containing lexicalized causatives do not.

However, McCawley (1972) in his reply has shown this claim to be vacuous by giving instances of various lexicalized causatives, discussed by Shibatani, which are combined with adverbs that modify not them but a part of their meanings - which means that such causatives do contain underlying embedded clauses.

iii) Boku wa musuko o gakkoo ni sibaraka nokosita.

"I left my son at the school for a while."

iv) Saibantyo wa Ari o ninenkan rooya ni ireta.

"The judge put Ali in prison for two years."

(Sentences 16(a) and (b)  
in McCawley 1972:143).

McCawley also draws attention to a fact which Shibatani probably overlooked, viz., that the relation between a lexicalized causative and a corresponding intransitive differs from that of a causative and the corresponding simple verb; hence different notions of causation are involved in lexicalized causatives and derived causatives, e.g. in sentence i) the time adverb is modifying a part of the meaning of the lexicalized 'kill'.

We will make an attempt to answer the other criticisms also, but first let us clarify a few points. The question at issue in all these criticisms is whether it is justifiable to derive a lexicalized causative verb from an embedding semantic structure with the higher verb CAUSE and an underlying intransitive sentence. But the need for

relating such lexical items as kill, die, dead is not denied, and the fact that some relationship does exist between them is self-evident.

The underlying element CAUSE in McCawley's analysis roughly names a relation between events. The need for expressing such relationships was realized by Fillmore in his case grammar and in his analysis of transitive and intransitive open and cook, but even his grammar was not really able to explain the relations existing between sentences like:

v) The court legalized bussing.

vi) The court made bussing legal.

While it did capture the relation between v) and vii)

vii) Bussing became legal.

(Kastovsky 1973:262)

Fillmore (1971b) realized this problem and he also adopted McCawley's view of causation - as a relation between two events. The relation between v) and vi) above i.e. between explicit causative constructions and sentences containing the corresponding morphologically complex causative verb, can be made explicit only in a grammar whose base component directly generates semantic representations.

The criticism of the scope of the adverb caused McCawley (1972) to change his analysis of 'kill' slightly so that it now involved two separate notions, one of 'doing' - relation between person and action; and one of 'causation' - which is a relation between two events. Kill

was now paraphrased as 'DO CAUSE BECOME NOT ALIVE' and the underlying elements DO, CAUSE are justified because causative verbs embody relational notions which cannot be represented adequately by means of semantic features.

In criticism (3) an attempt is made to save a syntactic generalization involving the deep structure of the verb of a sentence. But this generalization itself is based on semantic notions which the syntacticians have no way of representing within their framework, viz., the notions of subject and object. For as Postal (1976:151) points out, TG does not permit a formal recognition of such notions, which are themselves relational in nature.

As criticism (2) Fodor states that the generation of sentences like

VIII) Floyd melted the glass on Sunday by heating it  
on Saturday.

"appears to be an artifact of the decision to derive surface verbs like 'melt' and 'kill', which are intrinsically constrained with respect to their time adverbs, from the same source which underlies surface verbs like 'cause' which are intrinsically relatively free with respect to their time adverbs" (Fodor 1970:433). But as he himself notes, these constraints are intrinsic because they vary from verb to verb, e.g. qualify operates on the same pattern as cause, while melt does not

ix) Floyd qualified for his degree in March by submitting his thesis in December

(Fodor 1970:433 fn. 5)

This being the case, such a criticism can hardly provide sufficient grounds for abandoning the analysis of 'kill', especially so in the revised form. The relations embodied in the verb can be adequately represented by the underlying semantic configuration, and the verb can be marked for its idiosyncratic adverbial constraint just as it is marked for other idiosyncratic properties in the lexicon.

Also the analysis of transitive/intransitive 'melt' etc. (as Fillmore's examples of 'cook', 'open') as the same lexical item, whose transitivity or otherwise is reflected by the case frame into which it is inserted, reflects a syntax-oriented conception of grammar, where the semantic component has a purely interpretive function, and we have seen that such a component is incapable of describing the relationships between related constructions.

The technique of lexical decomposition has much wider implications because of the insights it affords into the structure of language, although the above criticisms tend to give the impression that it was invented solely for the analysis of the item 'kill'.

The isolation of CAUSE as an underlying semantic element is a significant contribution of GS, for it plays an important role in the formation of the English verbal



system. The analysis of implicitly causative lexical items like kill, persuade (DO CAUSE BECOME INTEND) (McCawley 1971: 33 fn 1) is closely paralleled by the analysis of explicit causative verbs like legalize, demilitarize etc. which are respectively analysed as CAUSE (to) BECOME LEGAL and CAUSE (to) BE NO LONGER (in a) MILITARY (state) (Marchand 1969 and 1971). That is, word formation processes in which underlying semantic information is morphologically realized lend support to the above analysis of implicitly derived lexical items, since a marked similarity can be detected in both the processes of lexicalization. A description of the semantics of simple lexical items will profit greatly by setting up parallels between the structure of word-formation syntagmas and simple lexical items. And the examples of 'kill' and 'demilitarize' have shown that implicit causatives also go back to the same semantic structures and undergo the same types of transformations as do explicit causatives. The predicate-raising transformation, called into question by Fodor (1970), thus draws support from word-formation, which, (according to Kastovsky 1973, Lipka 1974, McCawley 1971 and Brekle 1970), occupies an intermediate place between syntax and underlying semantic representations, since predicate-raising in fact also produces morphologically complex lexical items.

Hence the predicate-raising and lexicalization transformations, so essential in word-formation, must be

considered to be equally justifiable as prelexical transformations which combine semantic material into "lexicalizable" configurations.

In any case, criticisms such as those of Fodor's seem to be an academic exercise on the part of a die-hard syntactician. The shortcomings of a syntax-based model are many, and its treatment of several natural language phenomena is only observationally adequate (cf. 4.4.1 and 5.3.1).

Analysis of words in the GS framework is best judged by seeing how adequately its assumptions and principles are suited to explain language in use, and whether the structure it proposes for lexical entries can be used appropriately to do the same things with sentences that people normally do in using language. Linguistic descriptions must be related to specific purposes, and it is only in terms of these purposes that one can judge whether a theory or a description is adequate or not. Our purpose in this work is precisely this - to judge which theory deals more adequately with lexical phenomena.

### 5.3. Semantic Issues and the GS Lexicon:

#### 5.3.1. Word-Formation as an Important Dimension for Judging Adequacy:

Word-formation as a linguistic process has been a subject of interest and study only for the last 10-15 years. Before that word-formation investigations dealt either with

diachronic questions or strictly morphological ones. And word-formation was generally better defined as a field of linguistics instead of a linguistic process. But the advent of the three semantic theories - interpretive, generative, and case grammar - changed all that. The present emphasis is on identifying and classifying the semantic categories that underlie word-formation syntagmas, and on assessing the importance of the relationship of word-formation to the rest of the grammar.

Since word-formation studies are in effect addressing themselves to the phenomenon of productivity in language, especially productivity in the lexicon of a language, it forms a significant dimension along which to judge the adequacy of a linguistic theory. Because the user's ability to extend and expand his lexicon by making use of the information already available in it to express new thoughts and perceptions is a very important part of his competence, any competent theory must make an attempt to describe and explain this ability which comprises both processes of rule-governed and rule-changing creativity.

A systematic description of word-formation processes based on underlying semantic generalizations etc. (since many word-formation processes are explainable in semantic terms alone), would not only lead to a simpler lexicon, desirable because the content to be learned would be less, but also to a more general and overall more elegant theory,

which will nonetheless take all aspects of competence into account. Such a theory is to be preferred to one which either pushes word-formation under performance (except of course processes like nominalization where some overt morphological marker is present), or chooses to list all word-formation syntagmas, compounds etc. in the lexicon thus making the latter impossibly large — an intuitively unfeasible and theoretically inelegant solution. Even cross-referencing different items in the lexicon which figure in compounding would not be an adequate description, since it would imply that word-formation is purely arbitrary whereas, in reality, it is not so, as the following sections will show.

A semantics-based description of the process of generation of lexical items and word-formation syntagmas can also provide an explanation of how new words are created; and the rules of combination of semantic elements into words can provide a possible explanation of the important theoretical notions: "lexical gap" and "possible lexical item."

Another important contribution of an explanatorily adequate theory of word-formation would be the discovery of linguistic universals in this area. Since word-formation is a widespread linguistic process in all natural languages, and since evidence from a number of sources indicates that processes like compounding and nominalization in any language are governed in part by a network of syntactic,

semantic and pragmatic universals, (and in part of course by language-specific preferences and requirements) such an expectation is not unjustified.

### 5.3.2. Derivation of Word-Formation Syntagmas: Compounding:

The synthetic approach to the description of language inherent in both generative semantics and interpretive semantics presupposes an analysis of surface structure as the only directly accessible material. This is also true in their treatment of word-formation and it is because of this approach that expressions like "additional semantic features" are used, since they are additional if one starts from surface structure. But actually these additional features are part of the meaning of these syntagmas and hence have to be accounted for in the deep structure, whether it represents or determines the meaning of the surface form, depending on the type of grammar advocated.

But the interpretive semantic theory faces trouble in its analysis when it comes to analysing the less explicit word-formation syntagmas, and assigning them additional semantic features e.g. oil-well (semantic feature + produce/yield), birdcage (+ purpose), musical talent (+ attribute); or lexicalized formations like give up, whose surface form contains no information about their semantic structure. In fact it was because of such formations that Brekle's statement, "there is no sharp line between linguistic expressions

that are normally considered to fall into the domain of word-formation and those expressions which are treated as simple lexical items" (Brekke 1970:86), is largely held to be true. A major thrust of GS has been to establish word-formation as an intermediate level between the underlying semantic representation and the surface structure.

In the case of the less explicit and the lexicalized formations like oil-well, where the missing semantic element (in TG it would have to be a lexical item that is later deleted) could be either 'produce' or 'yield' or 'emit' etc., TG took up the position that since it is impossible on the basis of surface structure to decide which of these items represents the relation between the constituents of the syntagma, "substantive compounds not containing a verbal element cannot be said to render semantically this or that sentence" (Marchand 1966). Also, if these semantic features are to be dealt with at all in the framework of a syntax-based grammar, word-formation transformations will have to be assumed to be meaning-changing (Kastovsky 1971).

But on both these counts a base component generating semantic representations which may or may not be transformed completely into specific lexical items, will facilitate the description. And if the semantic elements are directly introduced into the deep structure, one could do without the meaning-changing transformations: additional arguments in favour of a semantically motivated base component.

In this section we will briefly discuss, within J. Levi's framework (which is formulated within GS theory), the generation of word-formation syntagmas, especially nominal compounds and what Levi (1978) calls 'compounds with non-predicating adjectives'.

Compounding is a richly productive naming device and the formation of compounds is usually based on permanent, non-predictable relationships of varying semantic types between two entities. Predictable relationships are not suitable for compounds because given the head of the compound, the modifier carries no additional information e.g. book-novel, and the ability of the compound to serve as a naming device is not fully utilized (Downing 1977:831). There is moreover some kind of generic relationship between the members of a compound. As the Gleitmans put it (1970: 96), "not every man who removes the garbage is a 'garbage man'. Only a man who occupationally, customarily, eternally removes the garbage is a garbage man." With such characteristics it is natural that many new compounds survive beyond the situation in which they are coined and acquire more and more the characteristics of a unitary lexical item, possibly thereby losing their analysability into an underlying clause or sentence. Compounding thus serves as a backdoor into the lexicon (Downing 1977:824). J. Levi in her work has however considered only lexicalized compounds and it is these we will discuss.

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Hindi admits of the greatest freedom in the use of compound words, the length and complexity of which form a distinguishing feature of the language. And the analysis of compound-word formations as derivations by means of deletion of an underlying element receives unexpected support from the processes of 'samaas' in Hindi. One famous example of 'samaas' is the lexical item simhāsana "throne". The word is now a semantically specialized lexical item whose original form has been lost because of subjection to historical processes.<sup>1</sup> But originally the form was simha čihnita āsana (Adj + N), "seat marked by the image of a lion" i.e. "throne". By the deletion of čihnita "marked" we get the lexicalized form simhāsana. The deleted element is not a predicate in the sense of Levi (1975, 1978) but Hindi is rich in processes of 'samaas' or compounding; and 'predicate' deletion, though one of the most important productive processes, is not necessarily the only one. But, as this example shows, derivations of complex word forms by means of deletion of an underlying semantic element is a perfectly legitimate technique, and historical evidence can also be brought in to support it. Incidentally this example of 'samaas' also provides support to the contention that word-formation rules (and also lexical insertion rules) must operate at an intermediate level between underlying semantic representations and surface structure.

Examples of some Hindi word formation syntagmas are:

I. N + N Compounds:

guru dakṣiṇā	"payment for the teacher"
sangīta kalā	"art of music"
bijlī ghar	"electricity house"
gulāb jal	"rose water"
hāsyā abhinētā	"comedy actor"

II. Adj. + N Compounds:

taknīkī sansthā	"technological association"
vidēśī mudrā	"foreign coins"
havāī jahāz	"aeroplane"

Apart from such two-word sequences listed above, there are also many combinations made up of two (or more) words, which are conjoined by rules of 'sandhi' to yield single unit compound words (both nouns and adjectives).

III. čirīmār	"one who kills birds"
lakḥpatī	"owner of a lakh"
pančakkī	"water wheel"
ghuṛsāl	"stable (for horses)"
gungān	"song of praise"

Other processes of compounding include copulative and coordinate compounds:

IV.	dëkhtë dëkhtë	"while looking"
	sötë sötë	"while sleeping"
	bër bër	"again and again"
V.	anë janë	"coming and going"
	amë samë	"face to face"
	parhë likhë	"one who can read and write; educated"

All these forms share many syntactic and semantic similarities, and all except category IV are processes of nominalisation, since there is plenty of evidence to show they must be generated under the node label N (Levi 1975, 1977). The constituent elements are dependent on each other for their meaning, although the precise semantic relationship is not indicated in the surface form.

Attempts have been made in traditional grammar and even in early GS accounts to characterize the relationship in terms of Fillmorian cases, and for deriving them from underlying relative clause or complement structures which contain the appropriate case markers or prepositions (Ljung 1970).

But there are some difficulties in the description of word-formation in terms of case grammar because of two different ways of deriving prepositions. They can either be treated as predicates (following McCawley) or they can be transformationally derived as features on NPs (Fillmore, Kastovsky). In the latter case the prepositions

function merely as case markers, whereas in the former they function as semantically non-empty elements which can be grouped under different predicates which have independent semantic status. It is the latter possibility which is significant for word-formation because a small number of general semantic predicates can be posited, in terms of which the relation obtaining between elements in combinations like those listed above can be explained. The use of predicates in characterizing underlying structure is desirable also because they can be specified in terms of semantic features which do not result in any particular surface lexical items. It is the semantic content of the nouns involved which determines the specification of predicates, hence the meaning of a combination is usually a bit vague. The combination, however, does fall within the boundaries of a semantic field, the latter being denoted by the predicate used in the paraphrase of the syntagma. Hence as Levi (1978) points out, the classification of syntagmas in terms of predicates "constitutes a significantly less redundant and descriptively more adequate account of the observable semantic distributions" (1978:77).

The basic semantic predicates Levi selects are CAUSE, HAVE, MAKE, USE, BE, IN, FOR, ABOUT and FROM. The compounds are derived by the deletion of the relevant predicate from the underlying semantic representation. In Hindi too, the variety of relations between the constituents

of compounds can be classified according to almost the same generalized predicates (each of which has a broad range of application because of its inherent vagueness). Levi points out that CAUSE and FROM have very restricted productivity in English while many cases of BE have alternative analyses under MAKE. The same seems to be true of Hindi word-formation syntagmas. However, our purpose here is not to provide confirmatory evidence for Levi's theory, but to show that a transformationalist account of word formation in terms of deletion of underlying predicates is possible and free of the inadequacies of a lexicalist account which fails to capture the productive aspects of word-formation processes.

A classification of some Hindi complex noun forms in terms of Levi's Recoverably Deletable Predicates (RDP) is given in the following pages (pp. 190, 191).

Corroboration for Levi's analysis and the RDP's she posits can be found in the treatment of 'samaas', compounding, in traditional Sanskrit grammar. (Compounding in Hindi closely parallels that in Sanskrit, and for our present purposes we will consider the two indistinguishable). We have already mentioned 'bahuvrihi samaas' in which the component elements do not retain their own meaning, and the compound becomes lexicalized with a distinct meaning. Some more examples of this type are:

<u>daśānan</u>	"who has ten faces" i.e. Ravana (the demon king)
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<u>RDP</u>	<u>Traditional term</u>	<u>Preposition</u>	<u>Examples</u>
MAKE	? instrumental	kē kī	madhu makkhī bijlī ghar kavi sammēlan rēkha Citra chātra sangha
USE/BY <sup>2</sup>	? Ablative/ instrumental	sē	rēl yetra mōm battī astropochar vigyan sammat ravahut agni pariksha puspa varsha
FOR	purposive; benefactive	kē liye	var mala kestāl pancha varshiya yojna chandra yan
IN	locative (spatial and temporal)	mē	samudratat durgahatna sthal pratāh kāl sardard svarga vās grishma avakas
			"honey bee" "electricity house" "gathering of poets" "line drawing" "student association"  "journey by rail" "candle" "surgery" "sanctioned by science" "invited by noise" "test by fire" "rain of flowers"  "garland for groom" "hair oil" "plan for five years" "space (moon) craft"  "seashore" "scene of accident" "early morning" "headache" "abode in heaven" "summer holidays"

Continued...

<u>RDP</u>	<u>Traditional term</u>	<u>Preposition</u>	<u>Examples</u>
FROM	source	sē	gulāb jal dugdha śhār hāthī dāt
ABOUT	topic	kā, kī	sulāh nāmā sangīt kalā prēm kahani rām katha
HAVE	possessive (rarely) dative	kā, kī	sarkārī makān makān mālīk vauvan śakti
BE	?	kī	varṣā ritu vidēśī mudrā
AND <sup>3</sup>	coordinate	aur	anā jāna jīvan maran mātā pitā amne samne
CAUSE <sup>4</sup>	causative	sē, dvārā	---

"rose water"  
"milk product"  
"tooth of elephant, ivory"  
"message of reconciliation"  
"art of music"  
"love story"  
"story of Ram"  
"government house"  
"owner of house"  
"strength of youth"  
"rainy season"  
"foreign currency"  
"coming and going"  
"living and dying"  
"mother and father, paren"  
"face to face"

čandraśekhara

"who has a crescent moon in his hair"  
i.e. Shiva (a legendary god)

āśivis

"who has teeth of poison" i.e. a  
snake.

But it is the 'tatpurush samaas' which is the most relevant for our present study. This 'samaas' has been subcategorized into seven different processes, more or less according to the different case relations holding between the constituents of the compound word. (The nominative case alone does not enter into compounding). Each of these word-formation processes consists in the deletion of a preposition (postposition in Hindi) or a case marker from the underlying relative clause source of the compound.

Briefly, the various kinds of 'tatpurush samaas' are classified as follows:

1. Nominative/Agentive: (not found).
2. Objective: svarga prāpt "one who has attained heaven."
2. Instrumental: tulsīkṛit "created by Tulsi",  
śarāhat "wounded by an arrow",  
akālpīkṛit "agony due to famine".
4. Involves foregoing rights on something:  
Kriṣṇārpan "offered to Lord Krishna"
5. Locative (spatial and temporal):  
janmāndh "blind from birth",  
dōśnikālā "exiled from country".



6. Possessive or dative:

rājaputra "son of a king",  
pitṛigrāha "father's house".

7. Involves deletion of m̃c (IN) and par (ON):

grāmvās "abode in a village",  
prēmmagan "lost in love".

3, 4, 5 and 6 are considered to be instances of the objective case which are governed by prepositions. The other types of 'samaas' in Sanskrit, except of course 'dvanda' which we have already considered under the RDP 'AND', are all broadly classifiable under the RDP's mentioned above, their independent categorisation in traditional grammar being motivated by considerations like whether the first component is a number, whether the compound denotes a collection (navratna "nine jewels"), whether the first word is the prime contributor to the meaning, whether it is prefixed etc.

Thus we see that the treatment of word-formation sketched in this section gains support from both the traditional grammar of Sanskrit, and the evidence of history: witness the lexicalization of compound forms. Further, it provides a more general and comprehensive framework for studying word-formation processes across languages, and provides a feasible explanation for the potential ambiguity of word-formation syntagmas. This is possible because the predicates, which effectively function as semantic

components in the definitions of the compounds, are not rigid and absolute in nature, with clear-cut cut-off points (cf. Section 5.5.1), but permit alternative interpretations, in accordance with natural language usage.

Finally, stating word-formation rules in terms of RDPs together with the componential analysis of lexical items, will lead to the organization of a more structured and adequate lexicon. The componential definitions of words enables the user to know the appropriate conditions for their use, and this knowledge can be made use of in building constraints into the statements of word-formation rules to show what kind of items will undergo them. Some pragmatic features will also creep into the picture while assigning RDPs to various compounds,

e.g. horseshoe is "shoe FOR horse",

but alligator shoe is "shoe MADE of alligator skin",

although, of course, it is as yet an open question whether these should be formalized as components or left as knowledge of the world.

Some explanation of random samples:

- 1) madhu makkhī "honey bee" (underlying predicate: MAKE).

The bee habitually makes honey; it may do lots of other things too, but its most salient characteristic which unambiguously identifies it is that it makes honey, hence this is chosen in the creation of the compound.

- 2) prakritik saundarya "beauty of/in nature" (Predicate: IN).

This is a case of a denominalized adjective in a compound. Beauty can exist in many things but what is meant here is a particular type of beauty. Hence this syntagma cannot be paraphrased as "beauty which is natural" but as "beauty in/of nature", and this would form its underlying source.

- 3) hāthī dāt "tooth of (? from) elephant" i.e. ivory. (Predicate: FROM).

But it cannot be paraphrased as "tooth belonging to elephant" because this would mean the entire physical object as such whereas the nominal compound refers to ivory. The semantic connection between the two is obvious and though the compound was originally generated from 'haathi ka dant', it is now semantically specialized.

- 4) An interesting example worth mentioning is the compound form rāmeśwar. It can be a product of three different kinds of compounding:

- a) Deletion of possessive predicate 'HAVE' i.e.

rām kā īśwar "Rama's god".

- b) 'Bahuvrihi samaas' since the referent of the compound is neither Ram nor god i.e. rām

jiskā īśwar "whose god is Rama".

- c) A case of two words getting together but referring to the same thing, thus achieving identity. This can be classed under the RDP 'BE', i.e. jō rām vohī īṣwar "he who is Ram is god".

The derivation of these nominals from underlying relative clause sources from which the semantic predicate is deleted by transformations captures all the productive aspects of this word-formation process. It cannot specify all that we know about the meaning of these syntagmas, since parts of the meaning are the result of lexicalization and are hence unpredictable. But a grammar is expected to capture and generate all the productive aspects by rules, and this is what an analysis in terms of deletion of predicates does.

The above examination further shows that the combinations follow common and frequent patterns, and that the ways speakers choose to name particular objects reflect a small set of organizing principles which can be expressed in terms of semantic classes. Besides, all the forms listed above have an element of semantic specialization which enables them to be treated like unitary, monomorphemic entries of the lexicon. (This again shows that word-formation has an intermediate place between DS and surface structure).

The pragmatic principles which determine the combinability of two items are, as we pointed out earlier, the permanence of the relationship, and the choice of a modifier which encodes the most salient feature of the modified noun. The same principles are used in the creation of novel forms also, and understanding becomes possible because the users of the language know the rules of the game and share the semantic and pragmatic principles involved, just as they share the rules of syntax involved in the generation of sentences.

But one point of interest to note is that, in the Gleitmans' (1970) analysis of word-formation, the deleted forms (Proverbals) are not recoverable. But Levi (1978) talks of recoverably deletable predicates, and classes compounds according to the predicates they take in paraphrase. The latter operation seems perfectly reasonable and provides a plausible explanation of word-formation. But as she also admits, compounds are many-ways ambiguous and CAN be understood under more than one predicate, although the potential ambiguity is reduced by both semantic and pragmatic considerations (cf. also Guru 1963:395). But the ambiguity exists, and once a compound is formed and achieves some semantic specialization, it begins to lose analysability. Hence, whether the deleted predicate is unerringly recoverable, as in the case of deletions by syntactic transformations, is doubtful. Or perhaps this operation of

recoverability is a characteristic only of word-formation rules, and is different from that of syntax.

Levi (1978) suggests that the group of predicates she has isolated are probably significant for the formation of noun compounds in languages other than English, and in our classification of a random sample of compounds in Hindi, we see that the same set more or less suffices. Hence one can perhaps hypothesize that this set of semantic predicates which are deleted during the word-formation process is a universal one.

However, this would be too strong a claim because it seems as if in Hindi at least there are no compounds which are derived by the deletion of underlying CAUSE. All causative constructions are morphologically marked as such. And although some compounds seem to be formed by deletion of underlying CAUSE, closer scrutiny in all cases turns up an alternative (and more convincing) analysis under the instrumental predicate BY.

This would suggest that there are interlanguage differences between the selection of deletable predicates for purposes of compound word-formation although many predicates are shared.

Another piece of evidence that suggests interlanguage differences in this area is the existence of coordinate and copulative compounds which are essentially composed of two or more nouns or adjectives which are

underlyingly conjoined but appear on the surface in a series. Their compounding is evident from the fact that the two occurrences of the same word have to be used together in order to make sense: that is, the series has been subjected to some semantic specialization. e.g. of copulative compounds in Sanskrit and Hindi are:

<u>čandrāditya</u>	"moon and sun"
<u>dēvasur</u>	"gods and demons"
<u>satyāntre</u>	"truth and falsehood"

(Whitney 1879:425)

<u>jīvan maraṇ</u>	"living and dying"
<u>khātā pītā</u>	"eating and drinking"
<u>bār bār</u>	"again and again"
<u>svarga narak</u>	"heaven and hell".

Such constructions can be analysed as formations by means of deletion of an underlying predicate AND -- and this is not found in English except possibly in examples like love-hate relation, where it is always used as a prenominal modifier and not as an independent nominal.

However, on the basis of this analysis, a weaker claim to universal grammar is justified: that a universal set of deletable predicates exist and a particular language may make use of only a subset of this set to play a productive part in its word-formation processes.

Finally, we would like to observe that such a treatment of word-formation is possible only in a generative semantic theory with its assumption of a generative semantic representation, and its provision for lexical insertion at a level other than semantic deep structure. Also the RDPs are similar to McCawley's use of semantic features or components in his analysis of various lexical items, and fit in well with the technique of CA which is widely employed in semantic theory.

#### 5.4. Other Semantic Issues:

##### 5.4.1. +EMP etc. in Hindi:

There are some interesting usages in Hindi which can also be used as supportive evidence for the GS treatment of the lexicon and of word-formation.

- I. The case of the generation of the lexical items hī and tō as emphasis markers, though tō in some instances is also used in senses corresponding to the English 'then' --

E.g.

- i) agar wō na jāye tō?  
"if he does not go, then?"
- ii) agar wō na jāye tō māī akēlā jāūgā.  
"if he does not go then I alone will go".



The words have no grammatical function and no real meaning to speak of, their sole purpose in a sentence being to add emphasis:

iii) māĩ akēlā hĩ jāũgā

"I will go alone (+ Emp)."

iv) māĩ hĩ jāũgā

"I (+ Emp) will go".

v) māĩ jāũgā hĩ

"I will (+ Emp) go"

vi) māĩ tō nahĩ jāũgā

"I (+ Emp) neg. will go".

vii) usne tō aisā nahĩ kahā

"He (+ Emp) did not say this".

viii) usne aisā tō nahĩ kahā

"He did not say this (+ Emp)".

A non semantics-based grammar has no machinery to generate such an item because all items are generated in the base component under a syntactic category and it is not clear to what category such an item belongs. And if "+Emphasis" is generated as a feature on the item which is emphasized, then how is it given an independent lexical realization? For there is no way by which lexical insertion can take place.

But if "+Emphasis" is generated as a semantic concept, the above problems become irrelevant. For

by incorporating +Emphasis as a syntactic category (a counter-intuitive solution), TG would explain nothing or at best achieve only observational adequacy, while the problem cannot be pushed under performance because the phenomenon of emphasis is a non-trivial one in language use, and can be adequately accounted for in a semantics-oriented theory.

In English, emphasis is taken care of to some extent by word-order, or by phonetic stress on the relevant item, since it doesn't have any direct lexical realization. But again a similar problem arises - where is the feature generated in order to trigger the relevant permutation transformation or stress assignment?

- II. Another usage in Hindi which poses similar problems is the use of items like āp, jī which can be characterized as "+Honorific"(Sircar 1978). True, that to explain the use of these items, knowledge of the world must be taken into account. In fact, the feature "+Honorific" is more a pragmatic than a semantic feature; but what it certainly is not is a syntactic category and as such, its generation in a syntactic base is blocked. Nor is it a property of surface structure because it has independent lexical realization, and in TG all lexical insertion takes place en-bloc at the deep structure level, a restriction which is not recognized by GS.

III. Another usage peculiar to Hindi which the lexicalist theory fails to explain and generate is the repetition of words in a series to achieve a specific effect.

ix) wō āte āte ruk gayā

"while coming he stopped (suddenly)".

x) wō dekhtē dekhtē gāyab hō gayā

"while (I was) looking, he disappeared (suddenly)".

xi) wō baiṭhē baiṭhē has padha

"while sitting he laughed (suddenly)".

xii) mujhō ṡay ṡay pasand nahī

"I don't like tea etc.".

How is the second occurrence of the item to be generated, as it must be, since the language does not permit its deletion or optionality in such constructions? Again, the only way to account for such usage is to generate whatever semantic idea they denote: intensity, continuity, variety, suddenness etc. But definitely such phenomena lie outside the explanatory scope of TG.

#### 5.4.2. Homonymy and Polysemy:

Among the different kinds of relations between lexical items that have been mentioned so far - derivation, inflection, compound formation, items belonging to the same semantic field (cf. Chapter III) - the relations of homonymy and polysemy obtaining between lexemes have proved the most

baffling and the most difficult to identify and formalize. The problem is crucial for the lexicon because its structure is bound to be affected by whatever mode of treatment a theory adopts for explaining homonymy and polysemy. For this reason any adequate explanation of the phenomena must reflect the principles of economy of organization of learned material, and a language user's ability to make maximum use of a limited repertoire of semantic concepts. The problem assumes additional importance because it is claimed that in some cases homonymy might lead to lexical ambiguity in sentences although as we shall show later, this is rarely the case in actual usage.

A great deal of discussion has been generated by the question of whether absolute homonymy exists in any language. Lyons (1977:560) has set out the following conditions for absolute homonymy:

- (1)  $L_i \neq L_j$  (lexemic distinctness)
- (2)  $L_i = L_j$  (syntactic equivalence)
- (3)  $L_i^* = L_j^*$  (formal identity)

With reference to these conditions he shows that, in English at least, all cases of so-called homonymy are only instances of partial homonymy, that absolute homonymy is just a fiction. This view is theoretically attractive because it upholds the faith in the principles of the organization of language, which do not permit the existence of two identical items which nonetheless function as two different words.

The concept of absolute homonymy would also be counter-intuitive in the sense that it would hamper communication and lead to unresolvable linguistic ambiguity in actual usage, whereas the nature of language is such that some explanation of ambiguity can always be found.

In this section we will show that in Hindi also no cases of absolute homonymy exist and that the case of homonymy as a theoretical principle for organizing the content of the lexicon is altogether too weak to be given serious consideration.

We have elected to choose examples from Hindi because Hindi follows a phonetic system of orthography and thus avoids any disagreement over whether the items concerned are both homophonous and homographic. In Hindi homophonous items are automatically homographic hence any dispute over whether the two items are formally identical in the phonic and graphic medium is avoided.

We shall first discuss some simple examples of apparent homonymy which fails to satisfy criterion (2). (Criterion (3) is the most elementary condition which has to be met if the question of the distinction between homonymy and polysemy is to be raised at all). For instance, a speaker of Hindi will always judge sōnā to be a homonymous lexeme: sōnā<sub>1</sub> "gold" and sōnā<sub>2</sub> "to sleep" because of the formal identity of the word, associated with the two different meanings. He will, however, always judge the lexeme

sīmā to be polysemous in constructions like: bevakūfī kī sīmā "limit of stupidity" and bhārat kī sīmā "border of India". He will justify his judgment in the latter case on the grounds that the two different uses of sīmā are related in meaning, that they share a common sense-element, or that it is a case of semantic transfer.

In most cases it is seen that a speaker's intuition guides him correctly in judging whether two items are homonymous or polysemous (although there are quite a few borderline or controversial cases); it is the linguists' task to posit a set of criteria to explain this judgement. Such a set has yet to be evolved.

Claims of homonymy leading to lexical ambiguity are unfounded since context is sufficient to resolve any potential ambiguity, e.g. kapḍē almārī meī t̃aṇḍā dō "hang the clothes in the cupboard." Here t̃aṇḍā means 'hang' or 'suspend', and by no stretch of the imagination could it be taken to mean 'log', which is the other meaning associated with the same lexeme. In this case another reason for the clear-cut judgement could be the fact that the two formally identical lexemes are syntactically non-equivalent, i.e., they fail to meet criterion (2).

i.e. t̃aṇḍā<sub>1</sub> → V ; t̃aṇḍā<sub>2</sub> → N.

In Hindi there exist many such cases of apparent homonyms that do not share a syntactic class, i.e. they

fail to satisfy criterion (2). Examples of such syntactically non-equivalent homonyms are -

- I.
- i) mār<sub>N</sub> "parting of hair"  
mār<sub>UV</sub> "to ask".
  - ii) khōyā<sub>N</sub> "milk product"  
khōyā<sub>Adj</sub> "lost" as in khōyā hua māl  
"goods that are lost".
  - iii) manā<sub>N</sub> "ban<sub>N</sub>"; manā<sub>V</sub> "cajole, soothe" and  
manā<sub>V</sub> "to celebrate" as in diwālī manā lī  
"celebrated Diwali?"<sup>5</sup>

There are, however, several cases of so-called homonyms that do share a syntactic class, but in this case the homonymy can be explained in terms of the different derivational histories of the lexemes concerned.

II. X<sub>1</sub> forms

X<sub>2</sub> forms

<u>sīnā</u> <sub>1</sub>	"chest" :	<u>sīnā</u> <sub>2</sub>	"to sew"
<u>sonā</u> <sub>1</sub>	"gold" :	<u>sonā</u> <sub>2</sub>	"to sleep"
<u>khānā</u> <sub>1</sub>	"food" :	<u>khānā</u>	"to eat"
<u>jīnā</u> <sub>1</sub>	"landing (of staircase)" :	<u>jīnā</u> <sub>2</sub>	"to live"

In the above cases X<sub>1</sub> and X<sub>2</sub> forms are both Nouns. But in all cases X<sub>1</sub> is a single, underived lexeme entered as such in the lexicon, whereas X<sub>2</sub> are all nominalizations from the underlying verb forms, formed by a process that can be roughly characterized as -

This nominalization rule is a highly productive one and is equivalent to the English gerundive and infinitive transformations, since in Hindi the infinitive and the gerundive have the same form:

mujhē sōnā hai "I want to sleep"

zyāda sōnā aḥā nahī "excess sleeping is not good".

The above cases of homonyms then would seem to be cases of accidental identity; the  $X_2$  forms being explainable on independent syntactic grounds.

A similar type of apparent homonymy is also present in Hindi:

- III. khilānā — khānā khilānā<sub>1</sub> "feed food"  
 — bac̣cō kō khilānā<sub>2</sub> "make children play"  
manāyā — tyohār manāyā "celebrated festival"  
 — rūṭhē bālak kō manāyā "cajoled a sulking child".

In both cases  $X_1$  and  $X_2$  forms are derivatives formed by the same rules. In the case of khilānā however the root is different, being khā "eat" in  $X_1$  and khēl "play" in  $X_2$ . In the case of manāyā the root is itself homonymous.

In the case of II and III then, the homonymy can be explained on independent syntactic grounds and the derived forms are not listed separately in the lexicon.



Any formal identity (condition (3) for absolute homonymy in the sense of Lyons (1977:560-563) in the case of III, i.e., that the related lexemes be associated with the same set of derived forms) is explained in terms of their different root forms.

I and II (some cases) do not display such formal identity and hence fall short of criterion (3), because  $X_1$  and  $X_2$  lexemes are associated with different sets of inflected word forms, word forms typical of nouns and verbs in Hindi:

- a)  $\underline{mān}_N$  :  $\underline{māgō}$  (oblique case),  $\underline{māgē}$  (plural)  
 $\underline{mān}_V$  :  $\underline{māganā}$  (infinitive),  $\underline{māgane}$  (oblique infinite),  $\underline{māgō}$  (imperative)

- b)  $\underline{sōnā}_N$  :  $\underline{sōnē}$  (ka) (oblique case),  
 $\underline{sunahrā}$  (derived adjective).

$\underline{sōnā}_{Nom.}$  :  $\underline{sulāna}$  (1st causative),  
 $\underline{sōyā}$  (past tense), other forms from  
 $\underline{sō}$  (verb).

Another point to be noted in the case of II is that, though the lexemes display broad syntactic equivalence in that both  $X_1$  and  $X_2$  forms are nouns, further classification into syntactic subclasses would not uphold such equivalence.

In the light of the above discussion, then, we agree with Lyons' conclusion that it is generally the case in Hindi as well as in English, that syntactic

non-equivalence of lexemes implies formal non-identity (1977: 561). That is, most cases of so-called homonymy are only instances of partial homonymy.

However, there is one truant case in Hindi that deserves mention manā<sub>v</sub>. We mentioned three forms earlier but manā<sub>N</sub> "ban<sub>N</sub>", is already syntactically distinct and hence can be eliminated from the discussion. But manā<sub>1</sub> "cajole", and manā<sub>2</sub> "celebrate", are both syntactically equivalent in that both are verbs and are lexemically distinct on semantic grounds. Further they display formal identity in being associated with the same set of inflected word forms:

manā<sub>1</sub> and 2: manāo, (imperative?)

manāyā (past tense), manānā (infinitive)

\*manāi (past tense + feminine).

It may be questioned whether manāi occurs with X<sub>1</sub>. This depends on whether or not the following forms are considered grammatical:

laRkī manāi gai "the girl was cajoled", and

laRkī manāi (yā nahī?) "cajoled the girl (or not)?"

If these sentences are accepted, this seems to be an isolated case of absolute homonymy according to Lyons since it apparently escapes criterion (2) and (3), but strangely it does not lead to any grammatical ambiguity. Perhaps the explanation lies in the fact that total

syntactic equivalence does not obtain between them since manā<sub>1</sub> takes a dative object and manā<sub>2</sub> an accusative object. Hence the normal forms for these sentences are:

laRki kō manāyā gayā.

hōlī manāi gai.

We have so far elucidated different kinds of partial homonymy, shown how they can be systematically explained, and that they rarely lead to any ambiguity. Instances of homonymy in any language are comparatively fewer than instances of polysemy, and this is only to be expected since homonymy does not reflect any basic psychological process; nor is it the product of any operative principle of language. Polysemy, on the other hand, is the product of metaphorical creativity and as such can give rise to lexical ambiguity, thus providing plenty of scope for funning and playing on words.

But as we pointed out earlier, a formal distinction between homonymy and polysemy is notoriously difficult to make, the only basis for recognizing the two phenomena being the informal native-speaker intuition, which is based on relatedness versus unrelatedness of meaning between two homophonous (in Hindi) items. Lexemic distinctness seems to be the only operative criterion, and even this is not infallible, as we shall show, since there are many controversial cases.

Examples:

jal "burn; jealous"

mũh "mouth" used in the senses:

khānā mũh mē dālā "put food in the mouth";  
and bōtal kā mũh "mouth of bottle".

kāt "cut" as in kapRā kātā "cut cloth" and  
"interrupt" as in bāt kātā "interrupt speech".

ghaṇṭā "hour; bell" where common semantic element  
is + time.

Few speakers would consider these items as homonymous, and nearly all would instinctively look for some kind of semantic relation between them to justify considering them the same word.

Intuitions might clash in these cases although some common semantic element can be identified in all cases; but in the following examples there can be no doubt of the lexemic identity of the underlined forms; yet there is a subtle difference in meaning which prohibits the deletion of the second occurrence of the same lexeme:

?i) wō subah hōli khēla aur śām kō tās (khēla)

"In the morning he played holi and in the evening he played cards."

- ii) wō kabhī skūl kī ghañtī bajātā hai aur kabhī sitār bajātā hai.

"Sometimes he rings the school bell and sometimes he plays the sitar."

- iii) wō kabhī madhur tāñ čertā hai aur kabhī laṛkiyō kō čertā hai.

"Sometimes he strums sweet melodies (on a string instrument) and sometimes he teases girls."

Distinctions of sense can be multiplied almost indefinitely in the case of lag or lagnā and its associated inflected forms:

- iv) mujhē lagā ki "it seemed to me"
- v) tēl lagāyā "applied oil"
- vi) wō pičc lagā hai "he is following"
- vii) pičc dum lagī hai "tail is attached behind"
- viii) dil lagāyā "emotionally involved/attached"
- ix) mār lagānā "administer a beating".

Positing a separate lexical entry for each different sense, in accordance with the lexicalist theory, would lead to a lot of redundancy in the lexicon. It would be better to follow the example of traditional dictionaries and maximize polysemy – that is, all the related senses of an item being associated with the same lexical entry. Since there are many more cases of polysemy than homonymy in any

language, such a solution would have the added advantage of reflecting the ability of the native speaker to extend the sense and denotation of lexemes by a process of metaphorical or semantic transfer. Metaphorical creativity is an integral part of a speaker's competence and the theory should reflect this principle of metaphorical extension by finding some way to show how different senses of a homophonous (or homographic) item are related. Maximizing polysemy would also considerably reduce the amount of idiosyncratic information to be relegated to the lexicon, thereby lessening the amount of learned material and aiding the process of easy and natural recall.

#### 5.4.2.1. Polysemy and GS:

Clear instances of polysemy then, are far more numerous in language than instances of homonymy, and this is only to be expected since polysemy - the product of metaphorical creativity - is an integral part of every speaker's linguistic competence, and is essential to the functioning of languages as flexible and efficient systems of communication.

Maximizing polysemy as a methodological principle implies giving theoretical priority to a speaker's ability to recognize relatedness of sense more readily than unrelatedness of sense. Moreover it has the added advantage of being easily applicable (by means of positing

either similar semantic components, or optional features, cf. 5.5.1).

Such applicability is possible in a lexicon that is structured along lines different from those which permit only the listing of discrete lexical entries. A lexicon that 'generates' its entries by means of various combinations of semantic components is the kind that can afford to utilize polysemy. It will also be compatible with the notion of creativity (i.e. the speaker's ability to extend the system by means of motivated but unpredictable principles of abstraction and comparison; in other words, by using strategies instead of rules (Lyons 1977:549). Such phenomena like creativity, productivity and polysemy - all integral parts of competence - cast doubt on the validity of the TGG assumption that all lexemes of a language can, in principle, be listed in the lexicon. The discussions in the earlier sections is designed to show that such is indeed the case. And all three phenomena have been shown to be explainable within a theory like generative semantics, which, in addition to its realistic assumptions, makes extensive use of the technique of componential analysis to study semantic data. Although the two, generative semantic theory and CA, are logically independent of each other, GS has usually been presented in close association with CA; and its assumption that it is possible to analyse the semantic structure of all languages in terms of (universal) sense

components is very similar to the assumptions on which CA is based. Certainly both have received their share of criticism, but they have not only demonstrated beyond doubt the many inadequacies of the TGC approach to language, but have also shown that if any theory of language is to be explanatorily adequate, it must be semantics-oriented. And of course they have immensely increased our understanding of the issues involved in constructing a generative model of a language system.

#### 5.4.2.2. Relevance of Transfer of Meaning to Question of Polysemy:

As Nida has carefully spelled out (Nida 1975), the lexicologist must show the relationship between all the senses of a lexical item i.e. polysemy, and also the relationships of related senses of different lexical items; and attempts have been made to explicate this notion of 'relatedness of meaning' in terms of a componential analysis of the senses of lexemes, although they have so far been restricted to fairly clear-cut examples like bachelor. However the approach has otherwise been fairly successfully used in identifying semantic and lexical fields. Characterizing the different senses of a lexeme by means of the lexical decomposition of each into component semantic elements would provide a means of comparing the different structures and deciding whether they shared any sense components.



Semantic decomposition explains many kinds of lexical relations which are actually based on the principle of transfer of semantic features from a usage of a lexical item in one sense to its usage in another related sense, a principle also known informally as metaphorical extension, by which so many lexical items acquire polysemous status.

For example, words like simmer, burn, flame, fume are all terms from the process of heating and all are also used to refer to some kind of non-tranquil emotion:

- a flaming row
- burning with jealousy
- fuming with rage
- simmering with anger.

Similarly in the corresponding Hindi usage:

jal "burn, jealous"

āg (lagnā) "(catch) fire"

man mẽ āg lagi hai "there is fire in the heart."

Words like hot, cold, cool, warm are entered in the lexicon in terms of their literal meaning as expressions of temperature ranges, but they also have a parallel reference in descriptions of personality, like:

a hot-tempered person

a cold woman

a warm nature.

Apart from such parallel patterning in two domains, it is also possible to predict the meaning of related terms in one semantic domain, when they are transferred and used in the parallel domain (Lehrer 1973:96).

e.g. (1) thandā mijāj! mujhē tō burfīlā mālūm hōtā hai.

"A cool nature! Personally I find it ice-cold."

Cool and ice-cold are related in the temperature domain, but though ice-cold is not used regularly in the personality domain also, its meaning here is quite clear.

That is, in all these multiple senses a common semantic element can be identified. e.g. in the case of the several senses of lag (cf. 5.4.2), the semantic element ASSOCIATION (of something/someone with something) can be said to be the underlying semantic element. Or, in the case of the two or more meanings of thikānā "house; shelter":

E.g. (2) apnā koī thikānā banao

"make a house/shelter for yourself."

(3) uskā koī thikānā nahī, wō kare ya na kare

"there is no relying on him, he may or may not do it."

When a native speaker looks for similarity in the meaning, he'll probably come up with: just as a homeless person lacks a fixed base, similarly a whimsical person will act only according to fancies, regardless of what is

expected of him. That is, the notion of 'fixedness, stability' inherent in the meaning of thikānā has been extended in the metaphorical usage.

It is the identification of a common semantic element which justifies grouping such polysemous items under one lexical entry, but this common element must not be a high-order, universal one like Human or Animate. It should be what Katz called a 'distinguisher', one that sets aside that word from all other words, establishes its lexemic distinctness. Either this component as such, or any one of other components that serve as attributes or units in the definition of the lexical item can be utilized by the native speaker when he is coining a metaphorical usage. e.g. bachelor refers to "unmarried adult male" but the meaning of 'my bachelor aunt' is nonetheless clear to a native speaker because the significant common feature which has been metaphorically used is not the sex of the subject but the state of 'being unmarried'.

There is one interesting example worth mentioning. Consider the sentences:

\*(4) She fathered her child.

(5) He mothers his child.

Here the nouns father and mother have been used as verbs and we see that in the case of father<sub>v</sub> the +Male feature in the Noun has been retained. But in the case of

mother<sub>v</sub> the selection restriction has changed and the verb can take both +Female and -Female subjects. How then is "mother" to be entered in the TG lexicon? With clashing features or as two different entries?

The latter solution would mean that the item is being treated as a case of absolute homonymy, and we have seen that this is a counter-intuitive notion. Besides, the N and V forms are very obviously semantically related and it is the lexicologists' task to bring out this relationship. We can attempt to do this in terms of semantic components. 'Fathering' a child has a very specific meaning and hence very specific selection restrictions. But to be a 'mother' to a child inherently encodes the feature BE LIKE (a) MOTHER and it is the presence of this feature which makes the grammaticality and acceptability of (5) possible.

At this point we would like to recall that Weinreich (1966) too, has briefly dealt with the notion of transfer of features, but his treatment of it does not fit in with the scheme we have outlined (which is one essentially based upon a GS framework employing componential analysis).

Weinreich's 'transfer features' can be said to correspond to Chomsky's selection features, only they are so named because, instead of merely being available for ascertaining the compatibility of the verb and nouns in a sentence, they are actively transferred from the verb to the noun. Weinreich believed that such 'transfer' features

are of semantic significance since they provide some explanation of why certain words display a certain kind of syntactic behaviour e.g. 'believe' is said to have the transfer feature [Assertion] which 'request' does not have; while 'request' is characterized by the feature command which "is probably identical with the feature which forms imperatives" (Weinreich 1966:432).

Thus in a construction like 'I believe it' the feature [Assertion] gets transferred to 'it', which is unmarked, while in 'I believe the rumour', 'rumour' already has an inherent feature identical with the transferred one. However, this device, although it provides a semantic motivation for selection restrictions, and allows the statement of the "happiness conditions" for the use of a word, is nonetheless only the first step in our definition of transfer of meaning. We begin from the premise that all words in the lexicon are defined in terms of the semantic components which provide relevant information for their appropriate use, i.e. their literal meaning (Burling 1970, Leech 1974, Lehrer 1978) is specified. But, as we have seen, many lexical items are polysemous in nature because of the native speaker's ability to extend these literal meanings to new and non-characteristic contexts. This he does by extracting one or more 'central' features of the item in question and transferring them to the new context, thereby setting up a componential configuration which is different

from (by virtue of the connotations it acquires from the new context) yet obviously related to, the central lexeme. It is this process of metaphorical extension which we wish to explain by the notion 'transfer of meaning', and by which we hope to provide a systematic account of polysemy.

#### 5.5. CA in TG and GS:

All semanticists would agree that a theory of meaning must deal with (1) the way words and sentences are related to objects and processes in the world, and (2) the way in which they are related to one another in terms of notions like entailment, contradiction etc. And semantic well-formedness would depend on whether the linguistic sequence was experientially compatible, i.e. whether the units cooccurring do plausibly cooccur on the basis of experience in general (Chafe 1965).

It was to study these aspects of meaning that CA was employed by generative grammarians.

Chomsky's TG claims psychological validity in that the grammar is said to parallel the competence of a speaker. However, the basic component, the deep structure, does not have any mental correlate, and the many arguments against it are well-known. But Chomsky's use of the notions 'marked' and 'unmarked', and the use of features for the description of lexical items as simultaneous bundles of semantic, syntactic and phonological properties are a clear indication

of the use of the principles of CA. The scope of application, though, is restricted on account of the secondary status granted to semantics. CA was adopted for describing words since it was realized that words are not necessarily stored in the brain in the form in which they occur in speech, and they cannot always be analysed as strings of 'morphemes'.

The features entered in the lexicon were associated with a given lexical entry only as a random list, and were selected on the basis of their participation in lexical rules. The many shortcomings of this approach are discussed in Chapter IV, but the point we wish to note here is that CA was successfully applied at all levels of linguistic analysis, though its manifestation at the syntactic level in the form of selection constraints has been misrepresented since these constraints have been established to be semantic in nature, and CA is most fruitfully applied to the semantic area of linguistic knowledge.

Thus Chomsky's use of the device of features (components, sememes) in the lexicon may be seen to be a tentative agreement with the hypothesis (more strongly underlined by generative semanticists) that, "all semantic structure might finally be reduced to components representing the basic dispositions of the cognitive and perceptual structure of the human organism" (Bierwisch 1970:181), since implicit in this hypothesis is the insight that lexical items are not unanalysable or undefinable wholes. The CA

approach also underlies the theories of Katz-Fodor (1963), Bierwisch (1969, 1970) and Weinreich (1966). But the inherent limitations of the TG framework prevent a natural explanation of semantic phenomena like idiomaticity, transfer of meaning, compounding, etc.

This is so because TG is bound by the restriction that all 'idiosyncratic' information is to be entered in the lexicon, and its definition of idiosyncratic includes even those phenomena which display partial regularity of the kind that can be explained in semantic terms. This also hides the fact that although the vocabulary consists of items that are distinct from all other items and have to be learned, it nevertheless is structured according to semantic laws, and that knowledge of this structure is also a part of a speaker's competence. Just listing semantic components which cooccur in a definition misses out certain generalizations about word-formation processes which become clear when the model also describes how the components combine to yield lexicalisable structures. (The device of cross-referencing items is performance bound and hence can only be observationally adequate).

It is on these grounds that the GS lexicon is more explanatory, for the assumptions of the theory itself are more in accordance with psychological reality and hence its use of CA is more unrestricted and more effective. The GS treatment of words brings out the fact that the lexicon



of a language is semantically structured, and that even seemingly simple words are internally structured in a way that is parallel with the derivation of morphologically complex words. It is this all pervading network of underlying semantic generalizations and their relation with the real world which makes language acquisition the natural and systematic phenomenon which it is.

#### 5.5.1. Justification of Componential Analysis:

Componential Analysis (CA) is a direct development of the various attempts of linguists to formally define the role of meaning in language -- a task which seems to necessarily demand the isolation of semantic components and their arrangement within a structural model. The technique itself has been elaborated elsewhere (cf. Chapter III). Here we will justify and evaluate the importance of CA as a technique of formal semantic analysis.

Let us assume that the term 'meaning' means the ways in which features of language are related to things outside of language. How then can this relationship between language and the world be most naturally and accurately characterized? And what is the best way to describe the meanings of words and sentences?

CA is an attempt to provide answers to these questions. In anthropology where its worth was first recognized, CA was used most specifically to relate the

linguistic phenomenon of terms to the non-linguistic phenomena to which terms refer - and this is undeniably a part of speaker-competence and hence data for semantic analysis. In all the studies of terminological sets the effort had been directed to the extraction of adequate minimal definitions from the mutual oppositions of the items in the subset - definitions which consisted of shared or contrasting semantic features or components.

In recent years CA has come to be the most popular method used to give explicit representations to the systematic relations between words, and its main value lies in the economy of statement it permits in describing the semantically appropriate conditions for a term.

But the methodology of CA and the status of the components has been widely questioned. Bolinger (1965), while providing overwhelming evidence for abolishing the 'distinguishers' of the Katz-Fodor semantic theory in favour of describing a lexical item in terms of semantic markers alone, nevertheless wonders about what criteria to use to limit the numbers of markers, and how much of the marker system should be made explicit for an item, and what should be left as knowledge of the world. Kempson (1977) also maintains that CA only transfers the burden of semantic explanation from word meanings onto the components which constitute word meanings, e.g., human is said to mean HUMAN , but no interpretation or explanation is given for

how this component relates to the non-linguistic property of 'human-ness'.

Binnick (1972) makes the same charge: CA merely states the situation in some descriptive translation, which, however organized, is essentially empty.

The accusation has however been hotly rejected by Katz (1972:39) on the grounds that "it is quite unreasonable to insist at the outset ... on a clarification of the ontological underpinnings of the notions of concept and proposition as a precondition for accepting the explanation of semantic properties and relations given by a theory employing 'semantic marker'." And Kempson herself, in a self-contradicting statement admits that if the assumptions on which CA is based are sound "then there is a valid method of providing detailed motivation for individual components" (Kempson 1977:96).

Burling (1970) though, very reasonably observes that the undue concern with methodology<sup>6</sup> and the cognitive status of semantic analyses and components is a peripheral issue, since no more than in grammar, does it matter how the theory is reached, provided the analysis allows us to refer back to the data and to predict additional grammatical or semantic uses of language, and enables us to explain a speaker's choice of lexical item.

However, some explanation in the seeming circularity in the use of some semantic components can be given. Any

theory of meaning must provide for two essentially different ways of learning and defining the meanings of words. e.g. Mother must almost always be learned in context, as also say woman and animal. But words like uncle, cousin need to be explained. This certainly does not imply that such words lack relationship with the non-linguistic environment. But this relationship is the result of the direct extralinguistic associations held by the components which define them. That is, there are some items, associations and operations which come first in the learning process, in the sense that once these are learned they can be used to define a larger vocabulary, with, of course, the aid of the numerous grammatical resources available in language. This dependence upon 'reference' which is most evident in the study of closed terminological sets, also gives a reasonable basis for drawing a distinction between syntax and semantics. "All of semantics can be seen as ultimately based upon relations between language and other things. Syntax deals only with those relations between linguistic signs that do not involve reference outside of language" (Burling 1970:81).

Let us now go back to the first charge we mentioned, i.e. how to delimit the number of markers. Leech (1974:104) realizes the significance of the problem because he points out that it is important to justify the point at which one refuses to atomize further and to show that the contrasts and combinations of meaning one has recognized are

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necessary and sufficient to explain relevant data - if one wishes to justify CA as a technique of formal semantic analysis. A useful rule to follow in this regard is to recognize an opposition of meaning wherever it proves its value by allowing us to make generalizations covering a range of lexical items. This is not to say that further atomization might not have some use, e.g. atomizing [+ HUMAN] further into [- FEATHERED] which would explain the unacceptability of \*The pugilist had feathers. But this limited usefulness is greatly offset by the wastefulness of having an additional feature. Generality and explanatory value, then, are the criteria to be used in setting up components. (Chafe 1970 and Bendix 1966 have also set up specified operations for isolating constants of meaning).

In general, it is seen that the most frequent experiences of a culture are covered by the elemental (or atomic) semantic components of its language, including the metaphors and idioms. These atomic components are those that cannot be defined by other combinations of units, e.g. the component [BLACK] in 'night'. But all proponents of CA realize that a great number of components are also words in the language, i.e., they are not necessarily atomic by definition, though as elements of a definition they are atomic. CA, however, makes obvious that "complex units give language an infinite open-endedness which it must have if human beings are to use it to communicate the countless

unpredictabilities of experience that inevitably befall them" (Chafe 1965:36).

The explanatory value of CA can be judged by its ability to systematically account for various lexical relationships. Leech (1974) broadly characterizes these relationships into two pairs:

- (1) Synonymy and polysemy: relations between form and meaning.
- (2) Hyponymy and incompatibility: relations between two meanings.<sup>7</sup>

Briefly, hyponymy exists between two meanings if one componential definition contains all the components present in the other definition. e.g. woman is hyponymous to grown-up because the components making up grown-up [+ HUMAN + ADULT] are present in the definition of woman [+ HUMAN + ADULT + FEMALE]. Incompatibility between componential definitions means there is at least one component in one definition which contrasts with a component in the other. Similarly, synonymy occurs when different phonological forms have identical componential definitions; and polysemy when the same phonological form is defined by different componential formulas (for details see Leech 1974).

Two other criticisms levelled against CA are first, that this kind of structural approach to meaning imposes some kind of pseudo-rigidity and absoluteness on linguistic categories; and secondly, CA is confined to characterizing

word-meanings, and an extension of the technique to sentence meaning will lead to a very naive view of semantics.

The first accusation is unjustified because componential boundaries do permit some degree of 'fuzziness',<sup>8</sup> as is evidenced by the doubts in speaker's minds as to whether a given feature is a **criteria**l component of a definition or is simply a connotation. The problem was recognized and some glimmering of a solution forwarded by Lounsbury's (1956) reduction rules which provided a firm basis for saying that a word has one meaning which is more basic than its other more extended meanings.

It is this notion of literal and extended meanings which provides an explanation of metaphorical usage, and one way CA can formally incorporate it is to first give a componential definition of the literal meaning of a word and then describe how it is extended by providing optional components. This device of overlapping definitions of a word will also to some extent explain semantic shifts and change of meaning over a period of time.

CA, as a technique of formal semantics, considered the level of lexical choices first, since it is at this level that meaning seems to characteristically enter language. But meaningful choices are also made at the syntactic and other levels of grammar, and in a complete description of language, the two must be related, i.e., if CA is to have wider relevance, it must also account for

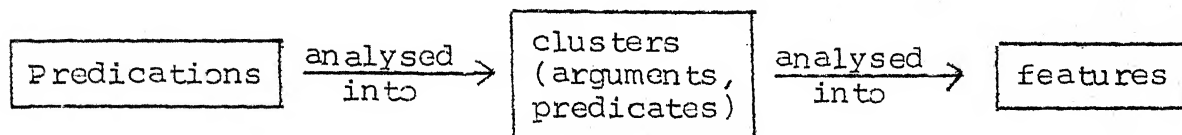
sentence meaning. The simplest account is to claim the meaning of a sentence to be the sum of the meanings of the words that compose it. There are many obvious objections to this.

Instead, Kempson (1977) offers a rather muddled account of what she calls "truth-based" semantics, according to which the unit of communication is the sentence and not the word, and the meaning of a word can be considered to be a schematic representation of its contribution to sets of truth conditions which comprise the meaning of sentences. In this account, though, she has followed Leech (1974), who makes use of essentially the same idea but presents a much clearer picture of how word and sentence meaning can be related in terms of CA.

Instead of talking about semantic analysis in terms of essentially syntactic units like the word and the sentence, Leech brings in units and structures which operate on the semantic level. The first of these is predication which corresponds roughly to a sentence. The extralinguistic notions of truth and falsehood relate to this. The next is the cluster, which corresponds to a word or phrase in syntax and which is the upper limit of CA, being similar to Weinreich's (1966) notion of giving sentential form to componential definitions. The 'cluster' consists of the third unit of semantic analysis - the component. Leech establishes how the semantic analysis of a sentence can be



conducted by breaking down predication into their constituent clusters. This together with the CA of words, then provides us with a semantic representation of an entire sentence.



(Leech 1974:133).

This kind of analysis thus not only validates the claim of CA as a viable technique of formal semantics, but also enlarges its scope, making it a more powerful and flexible means for systematically describing the meanings of words.

The appeal of CA further rests on the claims it makes to the psychological reality of the sense-components, and their universality.

Both of these claims have been called into question at some time or the other (Lyons 1977, Kempson 1977) but it would seem that these doubts spring from a mistaken understanding of the assumptions of CA. For instance, it is often believed (Alston 1964) that there is a direct connection between CA and conceptualism, that there is a one-to-one correspondence between surface structure words and 'concepts' (concepts being equated to mental images). Such a belief is entirely erroneous. There is only an indirect

relation between a surface element and its meaning, and the components of this meaning are manifested by concepts. Chafe (1970:75) maintains that concepts are real entities in people's minds, distinct from mental images, for concepts like truth, honesty do exist as ideas, even though they are not visualizable phenomena. Therefore, since semantic components are essentially factors obtained by the decomposition of the relations holding between related lexical items, they can be viewed as theoretical constructs whose postulation simplifies the description of semantic structure (cf. also Bierwisch 1970).

What the C. approach proves then is that semantic data are accessible to linguistic study. Admittedly there are problems in the attempt to approach concepts through observable data, problems which are absent in the observation of phonetic data, but this is no reason to give the latter unwarranted importance.

Since well-formedness and the acceptability of sentences reside in the semantic structure of sentences, and since the latter bears a direct relation to the world of observable ideas and meaning, semantics must be considered a more basic level than syntax, and certainly much less abstract than Chomsky's 'deep structure'. CA thus lends support to the theoretical assumptions of generative semantics. Like phonetic data, semantic data has direct correlates in observable facts, and for this reason,

semantic components must be viewed as psychologically real constructs.

The claim of CA to universalism rests on the assumption that there is a set of identifiable semantic components which are lexicalized in all languages - what Chomsky termed substantive universals. This seems a reasonable assumption considering the fact that the physical world perceived by all speech communities is the same, i.e., there is a common semantic area from which different communities draw the distinctions and features they wish to give verbal expression to.

"Languages differ semantically in relatively superficial ways" (Chafe 1970:81). This thesis gains support from the fact that cross-linguistic comparisons of a certain semantic field, or of a fixed area of vocabulary, are possible (Bendix 1966), and common semantic elements can be identified by such comparisons. The positing of such elements of meaning is justified further on grounds of the translatability of languages to a significant degree, and the fact that it is not word meanings that are translated but the sense communicated by them in a sentence.

As Bendix (1966) puts it - there is a substantial psychic unity of the human species in matters of language, and the bilingual individual's ability to express the same meanings in more than one linguistic code is proof of this unity.

However, although CA does not claim that all components isolated are universal, it does hold out the promise that much of what is discovered in the semantic area will be of universal validity, although it can be expected that different languages will exhibit many differences of detail, above all in the lexical area (cf. Wallace 1965 where he has shown that tests can be devised to test the psychological validity of CA).

So far, the only serious rival to CA seems to be analysis in terms of meaning postulates, which attempts only a partial characterization of lexical meaning. However, it also requires the use of semantic components or their theoretical equivalent to characterize meaning relations (cf. Kempson 1977, Bierwisch 1970). Hence it seems reasonable to conclude that at this point in time it is best to accept the methodological validity of CA, and to look for ways to extend the technique and make it more flexible, instead of threatening to abandon it because it does not answer all the problems of semantic structure and description.

#### 5.6. Conclusion:

In this chapter we have tried to show that the theoretical premises of the generative semantic theory are significantly different from those of TG, and that it views language as more than a system of mappings. It gives due weightage to the semantic dimension of language and gives

formal recognition to processes of formation as well as transformation, whereas TG had sadly neglected the former. By making the semantic structure generative and by establishing that well-formedness of utterances is determined in semantic structure itself, GS comes closer to giving a realistic representation of the nature of language.

An important consequence of this emphasis on semantic structure was that greater attention was directed towards the lexicon - a hitherto neglected component. The semantic decomposition of lexical items by means of componential analysis enabled linguists to gain important insights into the nature of semantic structure and established the fact that the lexicon of a language was not the arbitrary, unstructured component it was believed to be. In fact, the vocabulary of any language is a highly structured system of semantic components, indicative of the cultural predispositions of the speech community; while the structural principles themselves reflect the processes of cognition along which information is organised.

TGG devoted itself to studying merely the internal organisation of language - certainly no mean task, but because of its neglect of the context within which language is used, it lacked the wider perspective which must necessarily characterize any comprehensive theory of language. Cultural factors are inescapable especially in studying the lexicon of any language, yet such a notion is incompatible

with a TG framework because the theory is limited to defining the competence of an ideal speaker-hearer in a homogeneous speech community. Cultural context and the actual use of language in concrete situations are considered to be factors of performance, and hence outside the scope of a theory of language. Generative semantics need not be constrained by such limitations, and its notion of competence can be enlarged to accommodate the larger notion of communicative competence (Hymes, Campbell and Wales etc.).

Semantic analysis thus, assumes crucial importance for the adequate description of a natural language, although the data of semantics is very complex and at times seemingly vague. But as we have seen, CA is a promising tool for arriving at basic concepts, and is potentially capable of some day revealing the underlying basic structure of the phenomenon of meaning. The analyses in the last few sections show that a componential analysis provides a natural explanation of the different kinds of semantic relations which exist between items of the vocabulary in both Hindi and English. It is true that the technique still has a long way to go and may be modified many times as new problems arise, but it provides a good reason "to assume that a precise theory of meaning is possible, and that such a theory will provide at the same time important insights into the nature of cognitive processes" (Bierwisch 1970:184).

## CHAPTER VI

## CONCLUSION

The lexicon as a component of language theory has hitherto received scant attention. It is not surprising then, that it is the least understood component in spite of its central status - so much so that its role and function are still a matter of dispute. It has been our aim in this thesis to critically look at this problem. In the process we have arrived at a definition of the lexicon, examined the various lexical descriptions posited by different language theories, and as a natural consequence, we have come upon the techniques involved in describing lexical information and the intuitions of native speakers regarding the lexical items of their language.

To define the functions of an adequate lexicon, and to establish what kind of lexical description best serves this purpose, it was necessary to first trace the development of the concept of a lexicon, and to show what difficulties were encountered at each stage of the development. We also pointed out the causes of these difficulties, the solutions different theories proposed (within their respective theoretical constraints), and how these difficulties finally became the incentive not only for widening the scope of the lexicon, but for bringing about a radical

change in the orientation of linguistic theories. The change was justified as it enabled theories to posit more realistic assumptions about language, and to look for more natural and intuitively satisfying solutions for lexical problems, instead of forcing solutions within frameworks basically hostile even to the recognition of such problems.

Simultaneous with this change in the orientation of linguistic theories was the change in the nature of the lexical component. To reveal the nature of this change we have traced the growth of the lexicon from an insignificant component storing selective data about words (cf. Chapters II and IV), to a component of central importance in the theory of language which makes available to the grammar a variety of relevant information about lexical items, and which needs to be consulted at every stage in the derivation of a sentence.

The theoretical implications of this development in the nature and role of the lexicon are many, and we have attempted to systematically point them out in each chapter along with the factors which motivated the development. The change in the nature of the lexicon - from being a mere storehouse of irregularities to a fully-fledged lexical description of a language which attempts to explain various lexical relationships like polysemy, homonymy, tautology, word-formation etc. - has been our main concern in the discussion of generative semantics.



In Chapter V we have also tried to bring out the consequences these relationships, as also the derivational histories of words, have for the syntax of the language, and what contribution they make to the understanding of language as a whole. The adequacy of the lexical description advocated in this chapter also seems to be upheld by the computer-based natural language understanding programs we have discussed in the Appendix.

In our work we have also tried to show how this enrichment of the lexical component was necessitated by the requirement that it integrate all the various components of a linguistic theory - phonological, morphological, syntactic and semantic. (We have not taken account of phonological information in the lexicon since apparently it has not provided much scope for dispute, but we assume that a lexicon which adequately relates to the other three, will be adequate for phonology as well). In order to do this it had to be itself organized so that the data it accounts for, and the relationships among the data, are presented in an unambiguous and coherent manner. We have, accordingly, made an attempt to establish how the most adequate organization is achieved by structuring the information contained in the lexicon along the familiar principles of simplicity and generality so as to add to its explanatory power and enable natural and easy recall. In Sections 5.4.2 and 5.4.2.1 we have suggested that the maximization of

polysemy might prove a useful dimension along which to structure lexical information, and have given some justification for the suggestion.

Another major conclusion of this work is that a lexical description within the theoretical framework of Generative Semantics is best suited for fulfilling the functions required of an ideal lexicon. The work has been organized to show how, as linguists worked towards a greater understanding of the language phenomenon, the various issues listed in Chapter I were identified one-by-one and how, by the time GS came to be formulated, the lexicon itself had become a major issue in linguistic theory. The GS lexical description was a result of the search for possible solutions to all the issues, controversies, and inadequacies identified in the work: as such it is currently the best model for achieving the functions required of a lexicon.

To support the above conclusion, we have attempted to establish as systematically as possible the motivation for including semantic information in the lexicon, and the need to structure this information so that it is readily available to the user for both understanding and producing words and utterances. We have taken examples from word-formation, homonymy, polysemy, and some other usages in Hindi (cf 5.4) to show that the only adequate explanation for them can be given in semantic terms; also that if the explanation is to be at all significant, it must be

generalizable over a large area of data. This necessitates not only structuring of semantic information, but also a careful selection of the information to be represented.

We have found that the most effective technique for such a representation is one in which meaning is described as a system of components; and we have attempted to show that the various methods employed in the study of semantics all reduce to this basic assumption about meaning. Meaning resides in both words and utterances, and so far the most articulated technique for analysing it, based on the above assumption, is that of componential analysis. We have demonstrated the usefulness of this technique by studying its application to the description of the 'creative' aspect of language, especially the phenomena of neologisms (word-formation processes) and transfer of meaning (polysemy and metaphorical use).

Our study upholds the following claims of CA:

(a) that semantic components vary from language to language, for they impose some kind of structure on experience which may be different for different speech communities (e.g. kinship terms); (b) there may nevertheless be a small set of universal components common to all natural languages, which predispose us towards making certain distinctions rather than others, and (c) there is no fixed set of components for any language, nor are there any hard and fast semantic rules governing their combinations. This last

claim enhances the explanatory adequacy of a theory by making it possible to explain creativity and the open-ended nature of the lexicon in terms of the addition of new concepts to one's conceptual vocabulary.

## NOTES

Notes to Chapter II

1. "Structural" linguistics is the **older** term for this trend and is better used for ideas coming out of Europe that attempted explanation of language and gave laws taken as essentially valid for all languages alike. This is totally against the American tradition that languages could "differ from each other without limit and in unpredictable ways." Also, their belief that linguistics is a classificatory science, and it is needless to offer explanation where a sober taxonomy would do as well. Hence the term "Descriptive" was used to replace "structural".
2. By an "explanatory" theory we do not mean one that attempts explanation but one that lacks the operational restriction that there should be a mechanical procedure the application of which to data automatically yields an accounting. Experience, intuition and other subjective means can be used to select primitives or arrive at accountings.
3. Refer to original works for exposition of these techniques and to Davis (1973) for their implications.
4. Etic = raw data; emic = non-identical, distinctive units (Pike 1967:37-38).
5. Reference from Joos (1958:112).

Notes to Chapter III

1. Reference from Mendelbaum (1958:11).
2. Mendelbaum (1958:12).
3. Mendelbaum (1958:92).
4. Mendelbaum (1958:25-26).
5. Mendelbaum (1958:130, 140).
6. Mendelbaum (1958:10).

7. This goes counter to the field approach advocated by Boas and Sapir.
8. Sapir also made this observation as we pointed out earlier.
9. Reference from Papers in Linguistics (Firth 1957:7).
10. Papers (1957:190).
11. Papers (1957:28).
12. Papers (1957:24).
13. This awareness, of course, did not come into being until several years later, since linguists were temporarily side-tracked by the rigorous syntactic models that had in the meantime come to be accepted in America.
14. Papers (1957:224).
15. M = mother; B = brother; d = daughter; S = sister; s = son.
16. 'Elemental' is only a relative term, because the component is more elemental than the derived surface form.
17. Firth (1957:195) meant by the notion that if a word typically appears in the environment of other words, it takes on as part of its meaning its ability to appear in such environments. Here the basic idea was sound, but as Langendoen (1964) pointed out, there are several shortcomings in Firth's explication of it.
18. The mere fact that in CA each word gets one characterization in terms of criterial components is a major improvement over Firth's maintaining that the same word when used in a different context became a new word - thus maximizing homonymy - a very counter-intuitive notion. The CA treatment of words, however, reflects the fact that each word has a unique identity, and no matter what collocation it occurs in, its unique contribution to the meaning is a consequence of this identity. Thus the technique of CA is based on the belief that there is some structure, some principle of organization, in the content of the lexicon.

19. Relational components of this sort were also found in kinship e.g. 'father' → X parent of Y.
20. Purely structural analyses, though, merely make available convenient heuristic devices for making useful predictions - about peoples' behaviour in anthropological studies, or about syntactic behaviour of certain lexical items, as in TG.

#### Notes to Chapter IV

1. Katz (1964) shows how the traditional sense of mentalism is wholly compatible with Bloomfield's doctrine of "mechanism".
2. Word-formation is here taken to mean the formation of both complex and compound words from entities already available in the lexicon; and is expected to explain the morphological and semantic material which a derived form acquires.
3. There are other types of nominals which Chomsky did not consider and which cannot be naturally explained by either transformationalist or lexicalist theory - these we shall discuss later.
4. Lexicalization here means semantic specialization leading to loss of analysability, and necessitating an independent entry in the lexicon.
5. GS can be said to maintain such a distinction, since it certainly recognizes a concept of root word, even where semi-productive processes are concerned, the derivations being described in semantic terms.
6. Bowers specifically treats the case of abstract nouns and claims that Chomsky's model can be substantially simplified by removing the category from the base and deriving the forms by the application of syntactic rules to root words. Essentially a transformationalist stand.
7. See Bowers (1969:521 fn. 2) for further criticism of Chomsky's Remarks, especially Chomsky's notion of 'empiricism'.

## Notes to Chapter V

1. This type is called 'bahuvrihi' samaas, where the compound form has a meaning distinct from that of its components.
2. Predicate BY is not mentioned by Levi.
3. Predicate AND is not present in Levi's analysis.
4. CAUSE is a fairly productive predicate in English, but we could not find any examples in Hindi.
5. The homonymous verb forms of manā are explained later in this section.
6. Binnick (1972) questions whether components are descriptive tags (features) or building blocks (Abstract predicates); i.e. is part of the meaning of boy 'masculinity' or is the word boy partially distinguished by the tag [masculine]? The question just seems an instance of methodological nit-picking, without much theoretical significance.
7. Kempson (1977) follows Leech's use of these terms. Incompatibility or meaning exclusion includes relations of inconsistency, contradiction, antonymy and tautology, while hyponymy includes taxonomic relations, entailment etc.
8. Cf. Lakoff (1973), Waldron (1967) and Leech (1974) for further explication of this notion.



## APPENDIX

## COMPUTER-BASED NATURAL LANGUAGE UNDERSTANDING SYSTEMS

We have seen how lexical information is represented in some important linguistic theories which are committed to the generation of acceptable strings in a natural language. Here we will see how the same kind of information is represented in computer-based natural language understanding systems -- and its implications for lexical theory.

1. Relevance of Artificial Intelligence (AI):

A successful computer model of language based on a linguistic theory can be regarded as a kind of test for the adequacy and viability of the theory. As Putnam (1964) puts it: "'How would this theory of language, if correct, enable us to simulate language use?' is a question that detects pseudo explanations, and exposes question begging accounts for what they are."

This is so because writing computer programs forces one to articulate fully and at a technical level what one's theoretical presuppositions are. Not only does one have to state explicitly what the building blocks of one's theory are, but also how they are to be interconnected and what the boundary conditions are within which the theory is supposed to be valid etc. For a program is only as good as its user, and if the instructions, the definitions, the

whole model which the user provides as input is not well-defined and explicit, the model will be unacceptable, the program will not run. In this sense computer simulation provides a feedback to linguistic theory, as well as a way for objectively assessing it.

A translator for a language, or an interpretation-assigning mechanism must necessarily have built into it the vocabulary, and the rules of grammar of the language. And it is here that the main contribution of linguistics lies, i.e., in providing the kind of information relevant for understanding, and a description of how this information is to be incorporated so that it will be readily available for use.

As we will point out later, there are some limitations on computer simulations of natural language models, which prevent them from serving as completely adequate understanding systems. But unfortunately, these limitations are there in linguistic theory as well. Yet in spite of it, work in AI should assist the linguist in understanding the nature of the problems they have to cope with in trying to articulate viable linguistic theories.

## 2. Common Problems:

Both disciplines share common concerns since both are tackling what has come to be known as the "problem of representation".

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(i) Both AI and generative semantics (GS) believe that the appropriate level of representation for computation of meaning, inferences etc. is in some reduced or primitive representation, which is not directly related to surface forms. The goal being to show how language is organised to convey meaning, it becomes necessary to characterize the components or sets of ideas which constitute meaning. This belief is upheld by the fact that there is a considerable amount of psychological evidence to show that people are able to recall the content of what they hear without being able to recall either the actual words or the syntactic structure used.

A related and not-so-important problem both systems face is that of defending semantic primitives, which are notorious for being open to bad defences. For example, one possible defence which will be acceptable is to show that they have some objective reality, that they can be empirically discovered, that there is a 'right set' which is 'there'. But if such were the case, we would not be able to account for an essential feature of language - the fact that its vocabulary is open to change, and we can also function with alternative vocabularies. Wilks (1975) solves this problem by justifying his primitives on ground of functional value, while GS and practitioners of componential analysis (CA) admit to a degree of "fuzziness" about componential boundaries (Leech 1974).

All other problems are also essentially related to the problem of representation.

(ii) Role of inference: There was until recently no place in the generative paradigm for inferences from facts and inductive generalizations.

e.g. (a) He put the box on the table.

Because it wasn't level, it slid off.

(b) They fired at the women, and many of them fell.

The last it in (a) can refer only to the box on the basis of some kind of knowledge of the world about boxes and tables. But how is this knowledge to be formalized, so that say, pronouns can be assigned correct referents?

(iii) How to represent semantic information - so that inferences like the above are possible, and also the relationships between various words and word-senses are deducible.

(iv) should surface information be available at "deep" level? This issue is attendant upon the problem whether a deep structure in terms of primitives can adequately specify and distinguish word-senses, without transferring information specifically associated with the surface (or input) word.

### 3. Natural Language Understanding Systems (NLUS):

#### 3(a) Winograd's System:

The most impressive natural language interaction program so far is by Terry Winograd (1972). This system has

quite possibly one of the most completely articulated grammars of English built into it. And quite significantly this is not a transformational grammar, but is based on systemic grammar by Halliday because it provides a convenient classification and terminology for syntax. For as Winograd rightfully points out, what is needed is an approach that can deal meaningfully with the question "How is language organized to convey meaning?" rather than "How are syntactic structures organized when viewed in isolation?"

Winograd's system SHRDLU converses with a person about manipulations it is performing in a simple world of toy blocks. This system attempts to integrate all the aspects of language in combining linguistic knowledge with the knowledge of the world that is being talked about. It does not see each sentence as an isolated problem, but keeps track of the actions, events and earlier sentences of the dialogue to fit new facts into a meaningful context.

In designing the system, then, the main emphasis was on the interaction of the different components - syntax, semantics and reasoning. And the most useful organizing principle used was the representation of much of the knowledge as procedures.

In accordance with systemic grammar SHRDLU uses the word as the basic building block. There are word classes like Adjective, Noun, Verb, and each word is treated as an integral unit. It is not chopped into hypothetical bits

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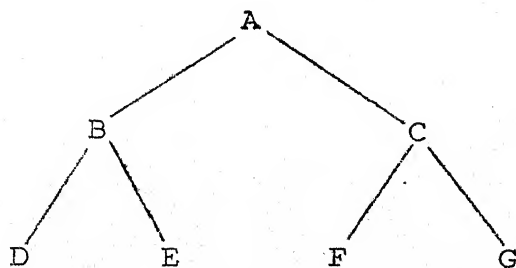
In accordance with systemic grammar SHRDLU uses the word as the basic building block. There are word classes like Adjective, Noun, Verb, and each word is treated as an integral unit. It is not chopped into hypothetical bits

(e.g. 'dogs' is not analysed as dog + s or dog + plural). Instead each word is viewed as exhibiting features. Thus the item 'dogs' is just a vocabulary item which has the feature 'plural' instead of 'singular'. True, this concept of bare word + features seems the same as analysing into hypothetical bits, but we will let this pass, since apparently this type of analysis lends itself to greater computational efficiency.

The entire system (all the different sub-systems of the program) is written in a computer language called LISP which is designed for handling complex symbolic data structures. Its basic building blocks are atoms and lists. In a language program atoms could be elements such as words, syntactic and semantic features, names and actions, properties etc. A list is the structure format in which these atoms (or other lists) are organized i.e., it is an ordered set of elements. It has the ability to nest lists within lists and this enables it to build and manipulate tree-like structures.

e.g.

(A(B(DE))(C(FG)))





the appropriate checks and build semantic structures. The dictionary entry for 'cube' is pre-stored as:

```
(N MEANS ((# BLOCK)((# IS ... # BLOCK)
           (# EQDIM ...))
```

and for 'red':

```
(N MEANS ((# PHY OBJ)(# COLOR ... # RED)))1
```

These entries are already in the PLANNER<sup>2</sup> format, except for the slots which are to be filled in by the semantic program with the name or identifier of the particular object being talked about. Supposing the name assigned is B1. Then we get the statements relating to this specific object as follows:

```
(# IS : B1 # BLOCK)(# EQDIM : B1)
(# COLOR : B1 # RED)
```

If now a question is asked "what is the colour of B1?" the program can immediately answer "Its' colour is red." This shows how knowledge is compiled about a situation based on the definitional structure pre-given about objects, attributes and relationships in the dictionary.

However, some further clarification is necessary. In Winograd's implementation it is not quite correct to say that each lexical entry is a procedure (Narasimhan 1979 : personal communication). Function words - Conjunctions like 'and', 'so', 'or', 'but' and others that form

links in a discourse - it is true are procedural, dynamic representations. But the proper way to look at what happens is that the usual dictionary entries are PLANNER statement skeletons, as shown above. And that the semantic interpreter is a program that converts these statement skeletons into statements by filling in the slots with argument names, and then assembles these statements to provide the correct interpretation of the input sentence.

The dictionary also has the facility to check for inflectional endings and parse accordingly, e.g. 'They easily saw the trouble and fixed it.'

The dictionary will show that the word 'easily', is made up of the root 'ease' and the ending '-ly' and provide features accordingly. It will also provide the program for 'and', and only when this is run by the semantic interpreter will it become clear whether 'easily' applies to both constituents.

This is important to note since it is in keeping with the system's orientation of syntax to surface structure, and its belief that much of 'deep structure' is more the province of semantics. It also implies that surface information is necessary at deep level if the correct interpretation is to be associated with the input text.

Areas of Inadequacy: Winograd's system cannot simulate the natural language phenomenon in its entirety, because of one essential difference. It is fairly easy to define

and formalize and take into account context in a computer model for understanding language, because the word it deals with is essentially a closed world. But it cannot deal with new situational aspects, since to do so additional knowledge will be required, and there is no way as yet to randomly incorporate such knowledge into the system. For in natural language, interactions relate to an open-ended world; hence it would be impossible to take into account all possible contingencies and their implications.

Besides, Winograd's system might possibly mislead readers into assuming that meaning in natural language consists only in procedures which can be actually manipulated by the user. This is so because the scope of natural language in SHRDLU is exhausted by a series of commands given to the system, which then shows its understanding of the meaning of the commands by carrying them out correctly.

Finally, the system makes only the most primitive use of the sort of deductions a human being is constantly carrying on. In choosing between alternative syntactic structures for a sentence, or multiple meanings of a word, we are constantly using a sort of high-level deduction. We are constantly basing our understanding on the answers to questions like "what interpretation would make sense given what I already know?" (Winograd 1974). This means that the various senses of a word, and statements of our factual knowledge about the world must be available somewhere

in the system -- a task relatively easy for a closed world, but extremely tough for a more realistic understanding system.

### 3(b) Wilks' System of Preferential Semantics:

For details of the system see Wilks (1975, 1977, 1978). Here we will only set out the salient points of his system with regard to their relevance for lexical theory.

First and foremost, the approach is based on the belief that understanding systems must be able to manipulate very complex linguistic objects, or semantic structures. It is also substantially different from Winograd's in that while Winograd concentrates on a dialogue within a micro-world, Wilks takes care to keep in mind that communication usually takes place in contexts which are open-ended.

His system constructs semantic representations for small natural language texts. All kinds of information, syntactic, semantic, factual, inferential are expressed within a single type of structure. The units of analysis are as follows:

(a) A formula is a tree configuration of a word-sense whose terminological nodes are semantic primitives.

(b) A template is a network of formulas representing a clause or phrase of text.

(c) A semantic block is a text representation consisting of templates, and is intended to correspond to the intuitive notion of message.

Wilks' system also has provision for referring to the relations between templates-like case relations, relations of CAUSE, REASON and CONSEQUENCE.

At this point it should be pointed out that Wilks' units bear a close resemblance to the units of Predication Analysis set up by Leech (1974), while extending the technique of CA to sentence meaning. The semantic primitives are of course the semantic components (features/markers) of CA, while Leech's notion of cluster corresponds to the template - or even sometimes to the formula. This is consistent with Wilks' usage since in a template, one or more formulas may be a dummy. Finally, the semantic block is none other than the predicate - which roughly corresponds to the syntactic unit of sentence. In fact, one can find many more parallels between the technique of CA (as implemented within the GS framework in Chapter V) and Wilks' understanding system.

To proceed. Wilks' system is designed to pick out the most normal sense for a formula or template, when faced with a choice.

Example: (1) John drinks water.

(2) John's car drinks gasoline.

The system would 'prefer' the normal sense of 'drink' with Animate subject in the first case, but it would not reject the second, which is an instance of preference-breaking (due to violation of the restriction + ANIMATE SUBJECT), since the whole idea underlying

preference-semantics is not only to prefer the normal, but to also accept the abnormal if it is described. It is for this reason that preferences cannot be entered as stipulations, or rigid selection restriction as in TG, because metaphorical usages are instances of rule-breaking without loss of meaningfulness, or even grammaticality - a notion incompatible with TG. But as Wilks' (1975) concedes, such defects have to some extent been remedied by GS.

Hence to account for (2) the system must describe the meaning of the metaphorical 'drink'. This description must include the information that cars can be said to drink by virtue of something a system might already know about them, viz., that they have a fluid (gas/petrol) injected into them through an aperture and they use that in order to run. That is to say, the program should have access to a sufficiently rich knowledge structure, called pseudotext by Wilks' (1978), to express the fact that cars stand in a relation to a particular fluid, a relation that is of the "same semantic structure" as the relation in which a drinker normally stands to the thing drunk. It is only by having such a knowledge structure that we can account for the naturalness of (2) as opposed to the absurdity of:

(3) My car chews gasoline.

(Wilks, not dated:16)

(An important aspect of the interpretation of (2) is idiomatic, viz. the use is in ~~ex~~cess, but this aspect of meaning is beyond Wilks' inference procedure).

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The information from the pseudotext is then used to replace the formula which was responsible for "preference breaking", the replacement being effected by means of projection operations.

A significant property of this system is that it considers representation of language to be the central task, and representation of knowledge as such makes no sense apart from its contribution to this task. The amount of 'knowledge' to be specified in the pseudotexts depends on the requirements of interpretation, but it is assumed that "a successful model of understanding will no more be able to tolerate 'information overload' than we can" (Wilks 1978:256).

Once again it is interesting to note how closely the insights of this system parallel those of GS and CA, which certainly existed since before the system was conceived, but of which no reference is made in the relevant literature. The problem of metaphor, or "semantic boundary breaking" is widely recognized by lexical theories. The selection restrictions of TG were posited to filter out 'normal' constructions, in Wilks' terms, but as we have seen the trouble was that it marked as unacceptable all constructions which violated the restrictions (or preferences), regardless of whether the violation was due to metaphorical usage, and whether any interpretation was possible. GS (together with CA) remedied this fault by representing all meaning (including selection restrictions) in terms of semantic components, and the

instances of preference-breaking Wilks talks of can very well be explained and interpreted within the framework we have outlined in Chapter V. For example, in sentence (2), the componential structure of 'drink' is seen to be incompatible with that of 'car'. Comparison yields the fact that the violation is in respect to the component *Animate*, which can be said to have been transferred to 'car', or alternatively, one can say that *Animate* gets suppressed so that what remains of the meaning structure of 'drink' is rendered compatible with part of the structure of 'car'. Where Wilks' system scores is in having worked out the details and incorporated them into a (hopefully) workable program for language understanding.

#### 4. Implications for Linguistic Theory:

The two systems described above tell us a great deal about the how and why of some of the shortcomings of linguistic descriptions.

(1) They show fairly conclusively that the generation of sentences is not in any interesting sense a demonstration of how the understanding of language takes place. It is true that insights used for generation can be used by understanding programs as well, but it is probable that dictionary structures especially may have to be different depending on whether one is interpreting sentences or generating them (Narasimhan 1979 : personal communication).



(ii) Winograd's work has shown the irrelevance of TG for understanding systems, or language analysis. For although TG is theoretically a 'neutral' description of language, it is in fact highly biased toward the process of generating sentences rather than interpreting them. Adapting generation rules for interpretation is extremely difficult for transformational grammars (Winograd 1972:42) because it involves 'unwinding' transformations to reproduce deep structure forms. Since a description of language must have both a generator (to produce sentences of language L) and a recognizer (to recognize strings of L), the failure of TG to provide the latter points to two different grammars - one for the speaker and one for the hearer - and this is absurd.

(iii) Procedural view of meaning: and the empirical validation of some insights of GS. We see that in Winograd's model semantics is almost totally equated with the word (Winograd 1972:28), and he states also that of all the linguistic theories made use of so far by AI, only those are favourable which give a primary place to semantics and allow a convenient classification and terminology for syntax, e.g. GS and systemic grammar.

There is a great deal of similarity between the computer handling of words and the generative semanticists proposal for describing words. What we would like to know is whether the GS lexical configuration is an indication towards procedural orientation. An exploration of this

problem reveals some interesting facts. The information pertaining to the lexical item that is initially made use of in the writing of the lexical procedure in Winograd's model (the LISP property lists) is basically that contained in the feature matrices of the conventional lexicon. This is so with regard to the syntactic properties of the item. The second part of the specification of the item is made up of its semantic components, and these are equivalent to the GS atomic predicates of the prelexical configuration (the GS feature of lexical decomposition is thus used by AI workers to advantage).

As Winograd himself points out, it is true that we can subdivide the world into rough classes such as animate, event, human etc., and can use this classification scheme to filter out meaningless combinations of interpretations. The semantics of Katz and Fodor (1963) and Chomsky (1965) are based almost entirely on this idea. But we should use it for what it is - NOT a complete specification of meaning, but a rough classification which eliminates fruitless semantic interpretations. Chomsky does not provide any further meaning to his lexical items, and the failings of his lexicon have been pointed out by McCawley and others.

Although each word is capable of being processed by the semantic specialist of Winograd, it is only non-content words that are procedures since they need to be endowed by the ability to refer to more than just the immediate

environment. (This limitation in the scope of procedural representation of meaning is necessary because procedural representations usually have the disadvantage that, if context of use is to be indicated for every 'item' of the vocabulary, then one will have to store the item a number of times, and this will lead to redundancy and confusion. Hence for most words the conventional declarative version is to be preferred, at least in AI work (Wilks 1977)).

This provides a possible solution to the dilemma of linguists who have not yet been able to arrive at any consistent treatment of such phenomena. Linguists, particularly TG grammarians, strive for uniformity in their treatment of words. Their task would be made much simpler if they realized the fact that semantics and syntax together play a vital role in the interpretation of a word, and that content words and functional words (words that hold a discourse together) need to be treated differently since they serve different purposes in the grammar of a natural language.

CS does not provide all the answers, but at least it has provision for treating words differently which can be extended and modified and used to advantage. Also it shows us that dictionary structures cannot be abstractly discussed and exhaustively defined solely in terms of binary features related to each other in terms of hierarchical domination, but that they must be related to the larger language processing system. This is precisely what AI understanding systems attempt to do.

The syntactical component of GS is similar to that of TG. But its main theoretical assumptions - that there is no distinct boundary line between syntax and semantics, both being referable to each others and its treatment of words according to the principle of lexical decomposition advocated by CA - are useful and interesting, and it is these that gain support from work in AI. GS certainly has greater explanatory power than TG, but whether it is superior to TG as a formally articulated theory is another matter.

## 5. Conclusion:

We feel that linguists and (computer based) natural language understanding system designers have complementary roles to play in extending our knowledge about language. While linguists, by virtue of working in an abstract and non-detailed level, can focus their attention on broad basic issues, understanding system designers can test out linguists' intuitions in the matter of details. For the latter have access to highly developed tools which make it possible to examine the details meaningfully in a feasible time span - tools like various programming language systems that can handle symbolic information mechanically, and large data bases where enormous amounts of information can be stored and manipulated. Also an understanding system designer has highly developed intuitions about what can be an algorithmic specification and what can not. For while a linguist might

successfully articulate a specific procedure, he will not always be able to judge its effectiveness. Thus the designer working with details can provide insights which a linguist may not have discovered; and this can be another fruitful area of cooperation between the two.

We know that a truly important intuition about language will be welcomed by both the linguist and the understanding system designer, as such an intuition will encompass both the breadth and the depth of the language phenomenon. It is therefore remarkable that such an acid test has been passed by the general notion that natural language is to be explained in terms of semantic based techniques, e.g. componential analysis. Thus already we have an important conclusion resulting from the examination of language from the linguist's and understanding system designer's point of view. We are confident that a closer cooperation between the two will go a long way in our attempts to understand the language phenomenon.

#### NOTES

1. 'Cube' refers to a noun which is an equidimensional block, and 'red' refers to the colour of a physical object.
2. PLANNER is the deductive system which is used at all stages of analysis wherever some kind of deduction or reasoning is required. This system is also written in LISP.

## BIBLIOGRAPHY

Alston, William P. (1964) Philosophy of Language. Englewood Cliffs, N.J.: Prentice Hall.

Anderson, Stephen R. (1976) "Concerning the notion 'base component of a transformational grammar'" in J.D. McCawley Ed. Syntax and Semantics Vol. 7. New York: Academic Press.

\_\_\_\_\_ (1977) "Comments on the paper by Wasow", in Culicover and Wasow (Ed.).

Ardener, Edwin (1971) Ed. Social Anthropology and Language. Tavistock Publications: London.

Ariel, S. (1967) "Semantic Tests", Man 2:535-50.

Beard, Robert (1974) "Word-formation: The anarchy of the art." Paper delivered at the 19th annual meeting of the International Linguistic Association.

\_\_\_\_\_ (1977) "On the extent and nature of irregularity in the lexicon," Lingua 42(4):305-34.

\_\_\_\_\_ (1978) "Derivations within derivations" in H. Rirnbaum (Ed.) Linguistics and Poetics Vol. I. Columbus, Ohio: Slavica Publishers Inc.

Bendix, E.H. (1966) "Componential analysis of general vocabulary", Supplement to IJAL 32(2).

Bierwisch, Manfred (1970) "Semantics" in J. Lyons (Ed.) New Horizons in Linguistics. Penguin Books.

\_\_\_\_\_ (1970) "On classifying semantic features" in Bierwisch and Heidolph (Ed.) Progress in Linguistics. Mouton.

Binnick, R.I. (1968) "On the nature of the 'lexical item'," CLS 4:1-13.

\_\_\_\_\_ (1972) "Review of Bendix Componential Analysis." FL 8:421-35.

Bloch, Bernard (1941) "Phonemic Overlapping," American Speech 16:278-84. Reprinted in Joos (1958).

\_\_\_\_\_ (1947) "English Verb Inflection," Language 23:399-418. Reprinted in Joos (1958).

Bloch, Bernard (1948) "A set of postulates for phonemic analysis", Language 24:3-46.

Bloch, B. and G.L. Trager (1942) Outline of Linguistic Analysis. Baltimore: Linguistic Society of America.

Bloomfield, L. (1926) "A set of postulates for the science of language", Language 2:153-64. Reprinted in Joos (1958).

————— (1933) Language. New York: Henry Holt.

Bolinger, Dwight (1967) "The Atomization of Meaning" in Jakobovits and Miron (Ed.) Readings in the Psychology of Language. Prentice Hall Inc.

Botha, R.P. (1968) The Function of the Lexicon in Transformational Grammar. The Hague: Mouton.

Bowers, F. (1969) "The deep structure of Abstract Nouns", FL 5:520-533.

Brekke, H.E. (1966) "Syntaktische gruppe (Adjeektiv + Substantiv) vs. Kompositum im modernen Englisch" in Linguistics 23:5-29.

————— (1970) Generative Satzsemantik und transformationelle generative grammar. The Hague: Mouton.

Bresnan, J. (1976) "On the form and functioning of transformations", Linguistic Inquiry 7.

Burling, Robbins (1964) "Cognition and componential analysis", American Anthropologist 66(1):20-28.

————— (1970) Man's Many Voices. Holt, Rinehart & Winston Inc.

Campbell, R. and Wales, R. (1970) "The study of language acquisition" in J. Lyons (Ed.) New Horizons in Linguistics. Penguin Books.

Chafe, Wallace (1965) "Meaning in Language" in E.A. Hammel (Ed.) Formal Semantic Analysis.

————— (1968) "Idiomaticity as an anomaly in the Chomskyan paradigm", FL 4:109-27.

————— (1970) Meaning and the Structure of Language. The University of Chicago Press.



Chafe, Wallace L. (1971) "Directionality and Paraphrase", Language 47(1):1-26.

Chapin, Paul G. (1970) "On Affixation in English" in Bierwisch and Heidolph (Ed.) Progress in Linguistics.

Charniak and Y. Wilks (1976) Computational Semantics. North Holland Publishing Co.

Chomsky, Noam (1957) Syntactic Structures. The Hague: Mouton.

\_\_\_\_\_ (1965) Aspects of the Theory of Syntax. MIT Press.

\_\_\_\_\_ (1970) "Remarks on Nominalization" in Jacobs and Rosenbaum (Ed.) Readings in English Transformational Grammar. Ginn and Company.

Cook, W.A. (1969) Introduction to Tagmemic Analysis. New York: Holt, Rinehart and Winston, Inc.

Cruse, D.A. (1973) "Some thoughts on agentivity", Journal of Linguistics 9:11-23.

Culicover, P., T. Wasow and A. Akmajian (1977) Ed. Formal Syntax. New York: Academic Press.

Davis, Philip W. (1973) Modern Theories of Language. Prentice Hall Inc.

Dik, S.C. (1967) "Some critical remarks on the treatment of morphological structure in Transformational Generative grammar", Lingua 18:352-383.

Downing, Pamela Ann (1977) "On the creation and use of English compound nouns", Language 53:810-842.

Dowty, D.R. (1972) "On the syntax and semantics of the atomic predicate CAUSE", CLS 8:62-74.

Fillmore, C.J. (1968) "The Case for Case" in Bach and Harms (Ed.) Universals in Linguistic Theory. N.Y.: Holt, Rinehart.

\_\_\_\_\_ (1970) "The Grammar of hitting and breaking" in Jacobs and Rosenbaum (Ed.) Readings in English Transformational Grammar. Waltham, Mass: Blaisdell.

Fillmore, C.J., and Langendoen, D.T. (1971) (Ed.) Studies in Linguistic Semantics. New York: Holt.



Fillmore, C.J. (1971) 'Verbs of judging: An exercise in semantic description' in Fillmore and Langendoen.

Firth, J.R. (1957) Papers in Linguistics. Oxford University Press.

\_\_\_\_\_ (1957) "Ethnographic analysis of language with reference to Malinowski's views" in R. Firth (1957).

\_\_\_\_\_ (1948) "The semantics of linguistic science" in R. Firth (1957).

\_\_\_\_\_ (1935) "The technique of semantics" in R. Firth (1957).

\_\_\_\_\_ (1951) "Modes of meaning" in R. Firth (1957).

\_\_\_\_\_ (1951) "General linguistics and descriptive grammar" in R. Firth (1957).

Firth, R. (1957) (Ed.) Man and Culture: An Evaluation of the Work of B. Malinowski. Routledge and Kegan Paul: London.

Fodor, J.A. (1970) "Three reasons for not deriving 'kill' from 'cause to die'," Linguistic Inquiry 1:429-38.

Fortes, Meyer (1957) "Malinowski and the study of kinship" in R. Firth (1957).

Gleitman, L.R. and Gleitman, H. (1970) Phrase and Paraphrase. New York: W.W. Norton.

Goodenough, Ward H. (1956) "Componential analysis and the study of meaning", Language 32(1):195-216.

Green, G.M. (1969) "On the notion 'Related lexical entry'", CLS 5:76-88.

\_\_\_\_\_ (1970) "How abstract is semantic structure", in CLS 6.

\_\_\_\_\_ (1974) Semantics and Syntactic Irregularity. Indiana University Press.

Gruber, J.S. (1976) Lexical Structures in Syntax and Semantics. Amsterdam: North Holland.

Guru, Kamta Prasad (1963) Hindi Vyakaran. Kashi: Nagar-pracharini Sabha, First edition (1920).

Hall, R.A. (1973) "The transferred epithet in P.G. Wodehouse", Linguistic Inquiry 4:92-94.

Halle, M. (1959) "Questions of linguistics", Nuovo Cimento 13:494-517.

Harris, Z.S. (1942) "Morpheme alternants in linguistic analysis", Language 18:169-80. Reprinted in Joos (1958).

\_\_\_\_\_ (1946) "From morpheme to utterance", Language 22:161-83. Reprinted in Joos (1958).

\_\_\_\_\_ (1951) "Review of 'selected writings of E.A. Sapir'", Language 27:288-333.

\_\_\_\_\_ (1951) Structural Linguistics. Chicago: The University of Chicago Press.

Hasan, R. (1971) "Syntax and semantics" in J. Morton (Ed.) Biological and Social Factors in Psycholinguistics (1971).

Henson, Hilary (1971) "Early British anthropologists and language", in Ardener (1971).

Hockett, C.F. (1942) "A system of descriptive phonology", Language 18:3-21. Reprinted in Joos (1958).

\_\_\_\_\_ (1947) "Problems of morpheme analysis", Language 23:321-43. Reprinted in Joos (1958).

\_\_\_\_\_ (1948) "A note on structure", IJAL 14:269-71. Reprinted in Joos (1958).

\_\_\_\_\_ (1954) "Two models of grammatical description", Word 10:210-31. Reprinted in Joos (1958).

\_\_\_\_\_ (1958) A Course in Modern Linguistics. New York: The Macmillan Co.

\_\_\_\_\_ (1961) "Linguistic elements and their relations", Language 37:29-53.

Hoijer, Harry (1966) "Anthropological linguistics" in Mohrmann, Sommerfelt and Whatmough (Eds.) Trends in European and American Linguistics: 1930-1960. Cambridge: M.I.T. Press.

Hudson, R.A. (1976) "Regularities in the lexicon", Lingua 40:115-130.

Hudson, R.A. (1976) "Lexical insertion in a transformation grammar", FL 14:89-107.

Hudson, R.A. (1977) "The power of morphological rules", Lingua 42:73-89.

Hymes, Dell (1964) (Ed.) Language in Culture and Society. New York: Harper & Row.

\_\_\_\_\_ (1970) "On communicative competence" in Gumperz and Hymes (1970) Directions in Sociolinguistics. New York: Holt, Rinehart & Winston.

Jackendoff, R.S. (1972) Semantic Interpretation in Generative Grammar. Cambridge: M.I.T. Press.

\_\_\_\_\_ (1974) "Introduction to the  $\bar{X}$  Convention". Paper distributed by the Indiana University Linguistics Club, Bloomington, Indiana.

\_\_\_\_\_ (1975) "Morphological and semantic regularities in the lexicon", Language 51:639-71.

\_\_\_\_\_ (1976) "Toward an explanatory semantic representation", Linguistic Inquiry 7:89-150.

Joos, M. (1958) Readings in Linguistics. The University of Chicago Press.

Kac, Michael B. (1972) "Action and result:: Two aspects of predication in English" in Kimball (Ed.) Syntax and Semantics Vol. I, Seminar Press.

Kastovsky, D. (1971) "The old English suffix -er(e)", Anglia 89:285-325.

\_\_\_\_\_ (1973) "Causatives", FL 10:255-315.

\_\_\_\_\_ (1974) "Word formation, case grammar, and denominal adjectives", Anglia 92:1-54.

\_\_\_\_\_ (1977) "Problems of word formation", pp. 301-335, Sonderdruck aus der Reihe: Kritische wissenschaft.

Katz, J.J. and Fodor, J.A. (1963) "The structure of a semantic theory", Language 39:160-210. Reprinted in Fodor and Katz (1964). The Structure of Language. Prentice Hall Inc.

Katz, J.J. (1964) "Semi-sentences" in Fodor and Katz (1964).

Katz, J.J. and Postal, P.M. (1964) An Integrated Theory of Linguistic Descriptions. Cambridge: M.I.T. Press.

- Katz, J.J. (1972) Semantic Theory. New York: Harper & Row.
- Kellogg, S.H. (1875) A Grammar of the Hindi Language. First Indian Ed. (1972) New Delhi: Oriental Books Reprint Corporation.
- Kempson, Ruth M. (1977) Semantic Theory. Cambridge University Press.
- Kroeber, A.L. (1909) "Classificatory systems of relationships", Journal of the Royal Anthropological Institute 39:74-84.
- Kurylowicz (1936) "Derivation lexicale et derivation syntaxique" (Reprinted in Hamp et al. Readings in Linguistics II (1966), University of Chicago Press.
- Lakoff, R. (1968) Abstract Syntax and Latin Complementation. Cambridge: M.I.T. Press.
- Lakoff, G. (1973) "Hedges and Meaning Criteria" in McDavid and Duckert (Ed.) Lexicography in English. New York: New York Academy of Sciences.
- Langendoen, T. (1964) "Review of 'studies in linguistic analysis'", Language 40(2):305-321.
- \_\_\_\_\_ (1968) London School of Linguistics: A Study of the Linguistic Theories of Malinowski and Firth. Cambridge: M.I.T. Press.
- \_\_\_\_\_ (1971) "The projection problem for presuppositions", in Fillmore and Langendoen (Ed.) (1971).
- Leach, E.R. (1957) "The epistemological background to Malinowski's empiricism" in R. Firth (1957) 119-138.
- Leech, Geoffrey (1970) "On the theory and practice of semantic testing", Lingua 24:343-364.
- \_\_\_\_\_ (1969) Towards a semantic Description of English. London: Longmans.
- \_\_\_\_\_ (1974) Semantics. Harmondsworth: Penguin.
- Lehrer, Adrienne (1974) Semantic Fields and Lexical Structure. North Holland Publishing Co.
- \_\_\_\_\_ (1978) "Structure of the lexicon and transfer of meaning", Lingua 45:95-123.
- Lees, R.B. (1960) The Grammar of English Nominalizations. The Hague: Mouton.

- Lees, R.B. (1970) "Problems in the grammatical analysis of English nominal compounds", in Bierwisch and Heidolph (1970).
- Levi, Judith (1977) "The Constituent structure of complex nominals, or That's funny, you don't look like a noun", CLS 13:325-338.
- \_\_\_\_\_ (1978) The Syntax and Semantics of Complex Nominals. New York: Academic Press Inc.
- Lipka, L. (1971) "Grammatical categories, lexical items and word-formation", FL 7:211-38.
- \_\_\_\_\_ (1972) Semantic Structure and Word-Formation. Munchen.
- \_\_\_\_\_ (1975) "Rediscovery procedures and the lexicon", Lingua 37:197-224.
- Ljung, M. (1970) English Denominal Adjectives. Lund: Acta Universitatis Gothoburgensis.
- Longacre, R.E. (1960) "String constituent analysis", Language 36:63-88.
- Lounsbury, F.G. (1956) "Semantic analysis of Pawnee kinship usage", Language 32(1):158-94.
- \_\_\_\_\_ (1965) "Another view of Trobriand kinship categories", American Anthropologist 67(5) Part 2:144-185.
- Lyons, J. (1963) Structural Semantics. England: Basil Blackwell.
- \_\_\_\_\_ (1966) "Firth's theory of meaning" in Bazell, Catford, Halliday and Robins (Eds.) In Memory of J.R. Firth. Longman Group Ltd.
- \_\_\_\_\_ (1977) Semantics. Vol. I and II. London: Cambridge University Press.
- MacNamara, John (1971) "Parsimony and the lexicon", Language 47(2) 359-374.
- Malinowski, B. (1920) "Classificatory particles in the language of Kiriwina", in Bulletin of the School of Oriental Studies I(4):33-78.
- \_\_\_\_\_ (1923) "The problem of meaning in primitive languages", Supplement to Ogden and Richards (10th ed.) (1966) pp. 296-336.

Malinowski, B. (1935) Coral Gardens and Their Magic. New York: American Book Co.

Marchand, H. (1960) "The categories and types of present day English word formation", Wiesbaden. 2nd Edition (1969).

\_\_\_\_\_ (1966) "On attributive and predictive derived adjectives and some problems related to the distinction", Anglia 84:131-149.

\_\_\_\_\_ (1971) "Die de-adjektivischen reversativen Verben im Deutschen, Englischen und Franzosischen". Tübingen 208-214. Reprinted in Kastovsky (1973) (Ed.) Studies in Syntax and Word-Formation. Munich.

Matthews, P.H. (1974) Morphology: An Introduction to the Theory of Word Structure. Cambridge University Press.

McCawley, J.D. (1967) "Edward Sapir's phonologic representation". IJAL 33:106-11. Reprinted in McCawley (1976).

\_\_\_\_\_ (1968a) "The Role of Semantics in a Grammar", in E. Bach and R. Harms (Ed.) Universals in Linguistic Theory. Holt, Rinehart & Winston.

\_\_\_\_\_ (1968b) "Lexical insertion in a transformational grammar without deep structure", CLS 4:71-80.

\_\_\_\_\_ (1970) "Where do noun phrases come from?" in Jacobs and Rosenbaum (1970).

\_\_\_\_\_ (1971) "Prelexical syntax" MSLL 24:19-33. Reprinted in McCawley (1976).

\_\_\_\_\_ (1972) "Kac and Shibatani on the Grammar of Killing", in Kimball (Ed.) Syntax and Semantics I (1972).

\_\_\_\_\_ (Ed.) (1976) Grammar and Meaning. Academic Press Inc.

Mendelbaum, D.G. (1958) Selected Writings of Edward Sapir. Berkley: California University Press.

Meys, W.J. (1975) Compound Adjectives in English and the Ideal Speaker-Listener. Amsterdam: North Holland.

Morgan, Jerry L. (1969) "On the treatment of presupposition in a transformational grammar", CLS 5.

Nida, E.A. (1948) "The identification of morphemes", Language 24:414-41. Reprinted in Joos (1958).



Hida, E.A. (1949) Morphology: The Descriptive Analysis of Words. Ann Arbor: University of Michigan Press.

———— (1975) Componential Analysis. The Hague: Mouton.

Ogden and Richards (1966) The Meaning of Meaning. London: Routledge & Kegan Paul.

Pike, K.L. (1967) Language in Relation to a Unified Theory of the Structure of Human Behaviour. The Hague: Mouton.

Postal, Paul M. (1976) "Avoiding reference to subject", Linguistic Inquiry 7(1):151-191.

Robins, R.H. (1971) "Malinowski, Firth and context of situation" in Ardener (1971).

Sapir, E.A. (1921) Language. New York: Harcourt, Brace & Co.

———— (1912) "Language and environment", American Anthropologist 14:226-242.

———— (1933) "Language" in Encyclopaedia of the Social Sciences (New York) No. 9:155-169. Reprinted in Mendelbaum (1958).

———— (1944) "Grading, a study in semantics", Philosophy of Science 11:93-116. Reprinted in Mendelbaum (1958)

Shibatani, M. (1972) "Three reasons for not deriving 'kill' from 'cause to die' in Japanese", in Kimball (Ed.) Syntax and Semantics 1 (1972)

Sircar, A. (1978) A Case for the Incorporation of Pragmatic Features in Generative Grammars. Unpublished Doctoral dissertation submitted to the I.I.T. Kanpur.

Studies in Linguistic Analysis (1957) Special publication of the Philological Society of Oxford. England: Basil Blackwell

Thompson, Sandra A. (1974) "On the issue of productivity in the lexicon" in Thompson and Lord (Ed.) Approaches to the Lexicon. UCLA Papers in Syntax, No. 6.

Waldron, R. (1967) Sense and Sense Development. London: Deutsch.

Wallace, A. and J. Atkins (1960) "The meaning of kinship terms", American Anthropologist 62(1):58-81.

Wasow, T. (1977) "Transformations and the lexicon" in Culicover and Wasow (Ed.).

Weinreich, Uriel (1966) "Explorations in Semantic Theory" pp. 395-474 in T. Sebeok (Ed.) Current Trends in Linguistics Vol. III. Mouton. Also published as Weinreich (1972) in Janua Linguarum, Series minor 89. The Hague.

Wells, R.S. (1947) "Immediate Constituents", Language 28: 81-117. Reprinted in Joos (1958).

Whitney, William D. (1879) A Sanskrit Grammar. Leipzig: Breitkopf and Hartel.

Wilks, Yorick (1975) "A preferential pattern-seeking semantics for natural language inference", Artificial Intelligence 6:53-74.

\_\_\_\_\_ (1975) "An intelligent analyser and understander of English" in Communications of the ACM 18(5):264-274.

\_\_\_\_\_ (1977) "Natural language understanding systems within the AI paradigm: A survey and some comparisons" in Linguistic Structures Processing (Ed.). Antonio Zampolli, New York: North Holland Publishing Co.

\_\_\_\_\_ (undated) "Four generations of machine translation research and prospects for the future". Report to the Department of Language and Linguistics, University of Essex. A fuller version of the paper is Wilks (1978).

\_\_\_\_\_ (1978) "Making preferences more active" in N.V. Findler, Associative Networks (1979). Academic Press Inc.

Winograd, Terry (1972) Understanding Natural Language. New York: Academic Press Inc.

\_\_\_\_\_ (1974) "Five lectures on artificial intelligence" reprinted in Linguistic Structures Processing (1977) (Ed.) A. Zampolli.

Zimmer, Karl E. (1972) "Appropriateness conditions for nominal compounds", Working papers on Language Universals, Stanford University 8:3-20.